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ABSTRACT

This document is a collection of articles growing out of a conference on technology and law related education. The papers are intended to give a broad overview of some of the technologies that allow access to more law related education information, to illustrate the potential of multimedia presentations, and to examine new tools available to teachers and students that enhance both the understanding and communication of law related concepts. This document contains 15 articles dealing with law related education and technology, as well as a program of the conference agenda. The articles include: "Distance Education: Using Technology to Make All America a School" (Pamela Pease); "Implications of Emerging Technologies for LRE on Students with Disabilities" (Wanda Routier); "An LRE Resource Directory" (Julia Ann Gold); "Tapping into Law-Related Information" (Julia Hardin); "Meet ERIC: Grandaddy of Education Databases" (Jane Henson); "NICELNet: Now Available on Compuserve" (Wanda Routier); "Welcome to WESTLAW" (Beth Wilson); "Energizing Social Studies through the Use of Technology" (Dick Rattan; Linda Spoales); "Interactive Law-Related Education: Making Students Part of the Action" (Don King); "Using Interactive Television to Bring LRE to Rural Schools" (Jan Harper); "Celebrating Law Day Via Satellite" (Marjorie Menzi); "Getting the Goods: High-Tech on a Low-Budget" (Harry Garvin); "Cable in the Classroom" (Ellen Sims; Dennis Urso); "Using Technology in a Big Way at a Small School" (Don Surgeon); and "Shining Worlds, Renaissance Exploration, and Stained-Glass Windows" (Bertram Cottine). (DK)

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Shining Worlds: Putting Technology to Work for Law-Related Education

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Introduction

Of the multitude of waves breaking on the shores of American education, none is more relentless or irresistible than technology. For those of us who associate school with the unmistakable smell of ditto master solution and the scrape of chalk on blackboard, the prospect of conversing on-line with experts and/or colleagues half a world away or accessing original source materials as high resolution digital images, is both intimidating and intoxicating.

The material in the pages that follow will, we hope, minimize the former while accentuating the latter. This publication is an outgrowth of an intensive three-day "Working Conference on Technology and Law-Related Education" held in Boston in October of 1992. Conducted by the American Bar Association Special Committee on Youth Education for Citizenship (ABA/YEFC) in cooperation with Apple Computer, Inc., the conference brought together more than 50 participants from 20 states to share ideas, compare notes and explore the "shining worlds" and new possibilities of both the present and the not-too-distant future.

The working conference, and this resulting publication, are intended to give a broad overview of some of the technologies which allow access to more LRE information, to illustrate the potential of multimedia presentations, and to examine new tools available to teachers and students that enhance both the understanding and communication of law-related concepts.

Each of the conference attendees and presenters brought to Boston a unique perspective. But whether they came from Sitka, Alaska or the Bronx, each shared a desire to learn about the technology, to share experiences and to see just how far they could push the edges of the possible. My thanks go to each of them.

Many individuals gave generously of their time and talents to help make this conference possible, and none more so than Jim Lengel of Apple Computer. Jim's single-minded determination to gather together the best that technology had to offer added immeasurably to the conference's impact and his wise counsel helped define it. My special appreciation and gratitude go out to Jim and to Apple Computer for its very generous in-kind contributions which helped make the conference possible.

Project Coordinator Paula Nessel will be long remembered and appreciated by conference attendees for her tireless efforts and attention to detail. My special thanks for a job well done. Finally, on behalf of YEFC, we thank the U.S. Department of Education for providing the financial support through its grant number S123A1005 that made both the conference and this publication possible.

Mabel C. McKinney-Browning
Staff Director
Special Committee on Youth Education for Citizenship
American Bar Association

Distance Learning: Creating New Opportunities for Education

PAMELA S. PEASE

Today, education is once again becoming a top priority for our nation. Policymakers, business leaders, and communities are recognizing that education is critical to our nation's ability to remain an economic and intellectual leader in the emerging global society. The re-examination of traditional institutions and instructional practices has become the hallmark of the 1990s.

In this present climate of change and experimentation, technology has been introduced as part of the solution for schools and communities challenged by the demands to do more for less money. Technologically-based resources are making it possible for educational institutions to embrace new ways of doing things.

Defining Distance Learning

The terminology associated with distance learning is often confusing to novice users. There is a great deal of jargon which refers to technology and other attributes. For example, the commonly used terms distance education and distance learning are used interchangeably, though many believe them to mean different things. Generally, distance education refers to the overarching mission or goal of providing educational curriculum-based resources to students using technology. Students who are separated by geography may earn credit or degrees using this electronically mediated educational system.

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Distance learning is defined as access to educational resources which link two or more people at geographically separate locations. Students are active participants in the process by communicating and interacting with others at separate locations.

Three common attributes characterize distance education or learning activities: 1) utilization of technology to deliver instruction and support services beyond the "brick and mortar" confines of the traditional face-to-face classroom; 2) participation by students at two or more geographically separated locations; and 3) interaction and communication between sites using technology (i.e., telephones).

Increasing Acceptance and Accessibility

Over the past decade, distance learning organizations and programs have become more accessible due to the availability and miniaturizing of video and computer technologies. Educators have become less wary of distance learning as they have come to understand how it may enhance, rather than supplant, traditional academic programs.

Seven important factors have spurred the growth of distance learning:

- **Legislative curricula mandates**—States have mandated increased requirements for elementary students and high school graduation, including foreign languages, consumer courses, and others.
- **Teacher shortage**—The teacher shortage in the critical subjects of math, science, and foreign languages is particularly acute in rural regions and the inner city.
- **Decreased cost of technology**—The miniaturization of the technology has resulted in lower equipment costs.
- **Increased satellite availability**—The launching of many domestic satellites in the 1980s reduced the cost of producing and delivering programming by satellite.
- **Increased access to technology**—The proliferation of cable TV hook-ups to homes, businesses, and schools have made it possible to successfully implement distance learning programming services.
- **Diversification of programming**—As the demand for distance learning has increased so has the variety and educational program options. Both credit and noncredit courses include subjects ranging from art history to physics to Japanese.
- **Government funding for research and development**—In 1988, the U.S. Congress earmarked millions of dollars for the development of multi-state telecommunication projects across state agencies, schools and universities. The funds, administered by the U.S. Department of Education under the Star Schools Program included money for the development of distance learning courses, and acquisition of broadcast and user receiving equipment.

Following on the heels of federally funded projects, a report was compiled by the Office of Technology Assessment for Congress summarizing the state of distance learning in the United States. In conclusion the research indicated that "...in most instances, distance learning appears to be as effective as on-site, face-to-face instruction in the classroom." (Linking for Learning, 1989)

Distance Learning Technologies

Typically, distance learning and education systems use technology such as one-way video television using satellite, cable, fiber optic or microwave technologies. The communication between students at different locations is facilitated most often using telephone lines.

Some of the technologies have been around for decades, such as radio, but their use has been reinvented to facilitate distance learning applications. The types of technologies which may be used are outlined below.

Radio. While people believe that two-way video and audio interaction is the optimum technology for distance learning,

radio has been effective in many less developed regions, such as Africa and Central America, in teaching subjects ranging from foreign languages to law to mathematics.

Even in more developed countries like Australia, radio has played a key role in educating those in remote areas. Since the 1920s, "the Outback School-of-the-Air" has provided programs for children of ranch owners and the network has just recently incorporated video components.

Despite the shrinking number of commercial radio stations, there is a growth in the satellite digital radio services which may deliver niche programming such as talk or sports-only formats and might include instructional programming, if and when public demand exists.

Telephone Services. The common dial-up telephone service is the most frequent method used to facilitate interaction between teacher and students. Audio bridging technologies allow telephone calls from two or more locations to be interconnected for spontaneous participation during a distance learning presentation.

Voice mail services allow a teacher to share information via pre-recorded messages and provide a user friendly method of storing phone inquires. Instructors are able to retrieve messages quickly and conveniently from any telephone. Some instructors use voice mail as both a communications and instructional tool. For example, students may call-in with answers to a short quiz or to recite their answers to an oral exercise in a foreign language class.

The typical telephone line can also provide video enhancements by digitizing and compressing the video information, enabling it to be transmitted over the switched telephone networks. The signal is translated by decoding devices at the user end that result in a slow motion video signal. The picture output of these systems typically is less refined than the typical television system as the entire picture is revealed to the receiver at a slow rate, with the result that movements may be out of sync from time to time.

One advantage of telephone transmissions is that one may send and receive two-way video and audio. For example, US West uses a digital compression system called T1 compression which allows a number of suitably equipped schools across its western region to participate in two-way audio and video instructional experiments.

Satellite Technology. There are many communication satellites from which a signal from a broadcast/studio facility may be sent directly to a leased channel (transponder) on a satellite; in turn, the signal is available to a host of users who have equipment (i.e., satellite antenna/dish) which is capable of receiving that satellite's channel. The originator of the broadcast leases time either occasionally or long-term (monthly/yearly) for the actual transmission of the information. Generally, the longer the lease, the lower the prices. Occasional use time may range in cost from $300 to $600 per hour.

Basically, there are two types of satellite frequency configurations—Ku-Band or C-Band. The equipment for both broadcasting and receiving each respective signal must be compatible.

For example, a Ku-Band broadcast requires the users to have a satellite antenna installed in such a way that it is capable of receiving its signal. The issue of equipment and signal compatibility has long been a source of controversy within the distance learning community. Today, many broadcast facilities and users have equipped their facilities to enable the reception of either signal.

Ku-Band satellites are less subject to terrestrial interference and have the capacity to split one transponder (channel) into two channels. This latter characteristic has been credited with launching distance learning activities; with two channels of programming available to schools, a more courses can be offered at a more affordable cost.

C-Band transmissions are generally less expensive for leasing satellite time. The single channel signal strength is frequently more powerful than Ku-Band, and many cable services use powerful C-Band satellites, such as Galaxy 6, for their services. These powerful satellites are able to reach users not only in the United States but as far south as the tip of South America.

First made available for public use in the mid-1980s, Ku-Band satellites make it possible for smaller satellite antennas to receive these direct broadcasts. Distance learning and many commercial networks now use these satellites, and plans to migrate their operations to a Ku-Band satellite which will be launched by AT&T by mid-1993. This will mark an era of new satellite networks which will open the way for digital television. The transponders on this new breed of satellites will allow one channel to be subdivided to offer 12 or more video channels which can digitize and compress the signal.

Cable Television. Since the 1960s, homes across the nation have been wired (cabled) to provide multiple channels of video programming directly into the home. The origin of this service grew from the inability of communities to receive television signals because of geographic barriers, like mountains and obstructive buildings which prevented the clear reception of broadcast television networks. For this service, each household pays a monthly subscriber fee.

Computer-based instructional software is often used to support or augment curricula delivered by distance learning.

Geographic areas of the nation are served by cable companies which are awarded franchise agreements through a competitive biding process within each community. These franchise arrangements include a renewal process whereby the competitive bidding is entered into periodically.

Today, over 80 percent of the television households in the United States have access to cable television services. In addition to the gains in household penetration, the evolution of cable television has included the development of multiple niche programming services, such as news channels, weather services, home shopping, and music videos. One example of such services is Mind Extension University (ME/U): The Education Network, which provides educational programing 24 hours a day.

Special one of a kind programs, such as premiere sporting events, are made available for an additional fee. The unique capability of the cable system allows a central office to monitor each subscriber and block or make accessible programming events by employing a specially assigned code.

Putting Technology to Work: Does Your School Have What It Takes?

Achieving success in putting new technology to use in an educational setting—or in any setting, for that matter—depends upon a thorough understanding of both the human as well as the technical factors that come into play. Keep in mind that people accept new ideas slowly, and are particularly resistant when change is thrust upon them. Adults, not surprisingly, have had much more trouble than students in adjusting to technological innovations.

For those beginning to explore technology as a teaching tool, the following points may provide some useful guidance:

1. **Provide leadership.** The lead administrator must understand and embrace program goals.
2. **Identify educational needs.** Conduct a needs based survey to identify what types of programming students and teachers want access to.
3. **Solicit buy-in**. Personnel who are expected to use the technology must be briefed and involved in the implementation process at the outset.
4. **Get the stakeholders onboard**. Educate the school board about the benefits of the program so that its members will be willing to allocate financial resources for adequate staff support, equipment, and other continuing expenses.
5. **Make the technology non-threatening.** Make it clear that the goal is not to use the technology to replace teachers or programs.
6. **Be patient and hang in there for the long run.** As with any innovation, allow at least two or three years to integrate the program into the existing curriculum.

Cable has served as a cost effective method of providing video programming. A television and an installation hook-up to a local cable system are all that is required to participate in this service. Frequently, these costs are much less than the upfront capital investment for an antenna, receiver and installation of a satellite downlink system.

Cable companies have a running start in serving needs of home viewers. The future promise of cable will require that all the systems be rebuilt with fiber optic technology. This is systematically being done across the nation as franchises are renegotiated. Some expect that the upgrading of cable systems will occur at a faster rate than with other services

As use of fiber optic cable becomes more widespread, a wide range of interactive services such as, transactional banking, shopping and even telephone services will become available. Fiber and satellite technology will allow cable companies to at least double their programming channels through digital compression, which is expected to occur within the cable industry by 1995. This will provide real opportunities for niche-based services such as education.

Microwave Technology. The operation of a microwave system requires a license from the Federal Communication Commission (FCC). The FCC has mandated that some licenses in each market be available strictly for educational purposes. Referred to as ITFS or Instructional Televised Fixed Signal, this technology is limited somewhat by its susceptibility to geographic interference; in addition, transmissions can be received only within a 25 square mile radius from antennae mounted on broadcast towers.

ITFS systems may represent some of the earliest forms of video based distance learning. Since the 1960s, colleges and universities have used the technology to teach courses to students located in nearby businesses or community centers. For example, Stanford University and the University of Southern California have used this technology to deliver high quality engineering curriculum to corporations in the Palo Alto and Los Angeles areas.

By the 1980s many school districts such as San Diego County Schools were awarded ITFS licenses to operate local, county and regional television programs to supplement instruction. The advantage of regional based programming is that television programs may be tailored to meet the educational requirements of local students and teachers.

It is common for these local ITFS systems to import and transmit programming from outside distance learning networks. In fact, "wireless cable" is a new category of service which allows operators to secure licenses that provide multiple channels of programming to a region using broadcast, microwave technology instead of coaxial cable or fiber optic technologies. In each application the operator is required to serve the educational needs of the local schools which reside in the broadcast area. Should "wireless cable" activities become widely diffused, they are expected to compete with existing cable networks.

Fiber Optic Technology. The installation of fiber optic cable across the United States promises to usher in an exciting new era of communications which will facilitate application of technologies such as two-way video, which will allow data and audio interaction between geographically separated users. It is anticipated that by the end of this decade, when the technology becomes pervasive, interactive business and educational applications will blossom beyond isolated experiments.

The rebuilding of a our nation's infrastructure with fiber optic cable is an extremely costly venture, with current efforts being largely spearheaded by the telephone and cable

companies. BellSouth has actively funded and implemented examples of fiber optic based distance learning activities in both Mississippi and North Carolina.

Computer-based Technologies. Computer technologies and related industries are playing a key role in developing distance learning applications. Using a modem, computers allow students and teachers to communicate through electronic mail and bulletin boards.

Computer-based instructional software is often used to support or augment curricula delivered by distance learning. For example, Oklahoma State's Arts and Sciences Department has used computer software and simulated speech modules to support their German program.

Distance learning has proven to be a cost effective and convenient way for educators to participate in staff development.

The emergence of computer-based video, audio and data into multimedia applications coupled with Integrated Learning Systems (i.e., Jostens Learning) offers the promise of innovative methods of blending computer, voice, data and video into future distance learning applications. In the not-too-distant future, it may be possible to capture distance learning activities and manipulate the video transmission to meet the learning style and needs of an individual user.

Peripheral Technologies. Decreasing costs coupled with increased consumer access to various types of technologies has enhanced distance learning programming. These technologies include: telephones with redial and speakerphones, fax machines, audio and videotape cassette players, and keypad devices for opinion polling. For example, the widespread adoption of videotape cassette players within homes and schools helped launch Mind Extension University (ME/U). ME/U was able to time shift the programming of academic resources to early hours of the morning; subsequently students who could not participate in real time programming could record programs for later viewing. Likewise, schools are taping academic resources that do not have copyright restrictions for class use at a later time.

Media Mix. As one would surmise from this discussion of technology, there is no single delivery system that can be termed "best" for distance learning. Most distance learning providers and applications employ a hybrid of technologies such as satellite and/or cable, telephone, computer mail and fax machines.

Successful Applications and Models

Though technology has a history of changing faster than human behavior, it is the innovative applications which are adopted and applied to everyday life that are responsible for changing the way things are done. Despite a resistance to change within educational institutions, the application of distance learning for instruction has been the largest area of growth over the past five years. These educational applications include the following:

Credit Courses for K–12 Students. There are numerous networks offering credit courses targeted to elementary, middle and high school students. Most schools desirous of these courses do not have a teacher in the subject area and/or have only a small group of students who are prepared for the demands of the subject matter. The most popular courses are foreign languages which include, Latin, Spanish, German, French, and Japanese. Elementary school level foreign language programs appear to be the newest growth area. Other courses range from English to sign language to physics and marine science. This curriculum is taught much as in a face-to-face classroom. The certified teacher is separated from the students but interacts through telephone and computer communications.

Personal and Professional Growth (Staff Development). Opportunities for professional growth training in the educational community as well as in the workforce generally are in increasing demand. Budget cutbacks in schools have resulted in the elimination of many school-sponsored staff development opportunities. But apart from budget cutbacks, the educational reform movement has increased the pressure on staff to upgrade their knowledge and skills. Distance learning has proven to be a cost effective and convenient way for educators to participate in staff development.

College Credit Courses and Degrees. Distance learning now makes it possible to obtain a degree from well-recognized academic institutions (i.e., George Washington University, University of Arizona, and Colorado State University.) For those with limited college experience, it is now possible to earn an associates degree as well.

Technology-based instruction is one more tool that has quickly moved from the research library to the classroom and the living room.

Noncredit Enrichment Programs. Distance learning networks increasingly recognize the need to provide lifelong learning opportunities beginning with preschool and extending through college and beyond. As we move into the 1990s, this may be an area of great programming potential for distance learning activities which can effectively bring expert resources from anywhere in the world into an educational setting. The types of resources may be a series of programs or a one-time event broadcast. Hence, the formats may be diverse.

In California, for example, Seaworld provides information directly from San Diego by satellite about educational aspects of marine life based on current exhibits or research. The Achievement Television Network of Malibu provides information about specialized topics directly from nationally-recognized authorities, and has originated programs from remote sites such as the U.S. Supreme Court. In addition, higher education networks such as those operated by SUNY-Albany provide informative program series on special interest topics such as school restructuring.

Distance Learning Law-Related Applications

Our nation's renewed appreciation of the value of providing quality educational opportunities for both young people as well as adults makes this time one of unique opportunity to craft new and different approaches to solve existing problems. Technology based instruction is one more tool that has quickly moved from the research laboratory to the classroom and the living room.

In a dynamic field such as law, there are a wide variety of linkages with law-related organizations, such as the American Bar Association and state or local bar groups, that might be used to enhance law-related educational programs. There are numerous local, state and national organizations which provide distance learning programs to schools, businesses and homes. There is no need to reinvent the wheel.

Given the expense involved in originating programming, one recommendation is that organizations with access to program resources should consider developing strategic alliances with established distance learning networks. The cooperative nature of sharing resources with others is, after all, part of what the decade of the 1990s is about. The key lies in developing partnerships and optimizing the use of resources to ensure success and build for future growth.

Pamela S. Pease is Vice President of Educational Program Development for the Mind Extension University (ME/U): The Education Network.

How Technology Can Help Students with Disabilities

WANDA J. ROUTIER

Students with disabilities have unique needs in the classroom. They tend to be visual and experiential learners, need more time to acquire information, need continual reinforcement, and require materials at appropriate reading and language levels. Research has shown that use of computer-based technology can help low-achievers master higher-order thinking skills, increase academic skills, and motivate students to learn. Students with disabilities demonstrate better behavior, motivation, increased cooperation and improved learning through peer tutoring when using technology that allows consistent and achievable success. Students also show improved basic skills, communication and interaction with the environment around them when using computer-based technology.

In a 1987 study, Henry J. Becker stated that computer technology "can enhance individual and social learning by providing immediate and appropriate feedback and individualized instruction, and by making difficult concept learning accessible through a less formidable simulated environment."

Because individualized instruction is so vital to teaching students with disabilities, it has been mandated by federal law. The Individuals with Disabilities Education Act, formerly known as the Education for all Handicapped Children Act of 1975, includes a provision which requires that each student found eligible for special education services have a written, comprehensive individualized education plan, or IEP. The IEP must be written annually by a team usually including teachers, the parent or guardian, school officials, and the student. The parent or guardian must approve and sign the IEP before services may begin. Computer-based technology can assist IEP implementation by giving teachers an effective tool to use with students that enables them to learn at their own pace, in their own style while retaining some control over their learning.

Many classrooms in schools today are focused toward linguistic and logical-mathematical teaching. Students with hearing, vision, thinking, or cognitive barriers to learning have tremendous difficulty in this type of environment. Those with disabilities learn best with active, experiential learning. According to Becker's study, "computers seem compatible with the way children and adolescents learn best—by enabling them to be active rather than passive and by being highly visual rather than overwhelmingly verbal." Technology offers teachers the ability to reach students with different learning styles, allowing information to be presented in a way that best suits the individual student's abilities.

Technology can alter text size for students who may need enlarged print, can provide synthesized or true speech for students who cannot see the computer screen or who need spoken reinforcement. Such adaptive technology allows students with physical disabilities to use the computer for communication in a class discussion that otherwise may be difficult because of the disability.

By using emerging technologies, students can direct their own learning at a rate and in a format that best suits them.

Law-related education strategies can be enhanced and student learning increased if technology is used as a supplement to traditional LRE teaching methods. In addition to a verbal discussion about proceedings in a trial, an interactive computer program that walks a student through the trial procedure and requires the student to make choices as a lawyer, judge, or jury, can provide alternative methods of learning for students who need an alternative to oral discussion or written handouts.

By using emerging technologies, students can direct their own learning at a rate and in a format that best suits them. Three types of technology that benefit the education of students with disabilities include computer assisted instruction, hypermedia, and distance learning.

Computer Assisted Instruction

Computer assisted instruction (CAI) can be loosely defined as using a computer and software to enhance learning. CAI has a multitude of adaptation possibilities and has been called "a great equalizer" because it allows students with disabilities to excel in areas previously not accessible to them.

CAI helps blind students learn to draw, teaches language to students who are deaf, synthesizes speech for students with speech disabilities, provides students who are autistic with a non-judgmental and interactive form of learning and communication, motivate students who are not performing, and provides a means of communication for students who are severely physically disabled whose mental capabilities may have been underestimated in the past.

In the law-related education classroom, CAI can greatly enhance traditional texts that may be used that are beyond the reading level of many students with disabilities. CAI may be used as a review of important terms or concepts found in legal issues, provide practice in formulating legal arguments for a case, or engage the student in an active review of a specific piece of legislation.

CAI can be used to present new curricular topics or to individualize language and reading levels for each student. Many students are unable to read their textbooks and retain information because of the complex vocabulary and language structure in the texts. This includes many law-related education texts and materials. Legal literature traditionally has been difficult for non-lawyers to read and these materials are often inaccessible to students with low reading levels. Research shows that students overwhelmingly prefer CAI to textbooks and that CAI is effective because it provides, as Horton, Boone and Lovitt point out in their 1990 paper, "self-pacing, frequent responding, correction, feedback, sequenced instruction, and the use of simple directions with responses configured to focus student attention."

Another positive outcome of using CAI is cooperative and collaborative learning that takes place between students. These interactions provide clear alternatives to the traditional "teacher-centered" classroom." As students get more involved with CAI, their work patterns become less competitive and more collaborative. As Dwyer, Ringstaff and Sandholtz note, "students talked to each other more, frequently asked for assistance from their neighbors, interrupted their own work to help someone else, and displayed tremendous curiosity about what others were doing."

CAI also provides an opportunity for students with disabilities to be creative and share their knowledge with others in the class. This interaction causes a change in both the role of teacher and student and in how students with disabilities are perceived by their peers. Using CAI may allow a student with a disability to lead a group activity or engage in peer teaching about a current law-related topic.

Hypermedia

Hypermedia allows students to collect, investigate, and manipulate large amounts of information on a computer. It includes not only textual computer input such as word processing, but also graphics, sound, animation, and other forms of information transfer.

Information is stored generally in "stacks" that enable the user to shed the limits of linear movement and instead follow a path of inquiry according to topics of interest included in the stacks. Students can investigate chosen topics much as they would use a library card catalog. In this manner, students select a specific topic from a general topic, then continue to select more specific topics as they are displayed on each subsequent screen.

In addition to allowing students to store huge collections of information from a variety of media in an extremely compact and accessible form, hypermedia offers a very high level of learner control over the material and has the potential to alter the roles of teachers and learners.

Stored data can be linked with on-screen prompts suggested by the author of the hypermedia program or users may elect to follow their own interests. Students can include sound, graphics, and text as they review and interpret the information, and can, if they choose, add their own verbal "notes" as they proceed. The impact of using their own voices within a computer program is astounding to most students.

Hypermedia provides students the opportunity to improve critical thinking skills and engage in self-evaluation, giving them a sense of ownership in their own learning. Students can critique their own work immediately, making them discerning critics aware of the both the learning process as well as its product. Self-assessment gives control to students, leading them to improved performance based upon their own evaluations, not someone else's judgment.

By giving students control of and access to material to be learned, they are able to move through the information at their own rate, reviewing or reinforcing the material as much as needed. As Higgins and Boone have noted, studies at the secondary level have shown that "the opportunity to have access to information more than once and have control over the presentation of that material may mean the difference between passing or not passing a course."

Hypermedia offers a very high level of learner control over the material and has the potential to alter the roles of teachers and learners.

This is especially true for students who often do not seek clarification or review of material more than once when in class because they do not want their peers to think they do not understand. Hypermedia technology allows students to review material privately as many times as necessary and therefore not only helps students achieve, but raises their self-esteem because they know they can do the work.

Use of videodisc or CD-ROM technology with a hypertext program can increase student learning even more. Video images are clear and precise when presented on a videodisc or CD-ROM. The videodisc usually allows many students to view the images because they are usually shown on a large television monitor.

After viewing a specific segment, students can then continue exploring the subject matter on their individual computer terminals, either working alone or in small groups. CD-ROM images are usually viewed by a few students at a single computer monitor, although a projection screen may be used for large group viewing. A 1991 study revealed that incorporating high-quality video and sound with text material has greatly increased attention span, rate of learning, and retention.

Hypermedia and LRE

Hypermedia is especially well suited for use in the law-related education classroom. In addition to learning about

topics directed by the teacher, students may actively develop their own "stacks," pursue a topic of special interest, and eventually become expert on the topic. Hypermedia which includes sound, text, graphics, and motion provide accessibility to law-related education activities that traditional discussions and handouts do not offer. It also allows students to review complex legal issues or concepts at their own pace, in a small group or in private.

Hypermedia is especially well suited for use in the law-related education classroom.

Students with disabilities in the law-related education classroom have been successful in building their own hypermedia "stacks" dealing with specific legal topics, such as the death penalty. Using the nationwide network of state LRE coordinators, these hypermedia "stacks" may be exchanged with students in other states where the law concerning the death penalty differs. Thus, students not only develop their own "stacks" and learn about the law in another state, but they also gain from the experience of exchanging their work with students in other states.

Distance Learning

Distance learning using telecommunications or computer-mediated communication (CMC) is allowing students with disabilities with unprecedented access to the world along with a world of information resources. In general terms, CMC can be defined as a communication across distances through the use of personal computers, modems, phone lines, and computer networks.

These "electronic links used for learning are creating new neighbors among schools, classrooms, teachers, students, and other members of the community" according to the Office of Technology Assessment. In fact, CMC is reaching far beyond the community to allow access to world-wide communications and distance learning in the classroom. This technology holds the promise of enhancing personal and professional development as well as reducing the isolation felt by both teacher and student, particularly in rural settings.

For example, distance learning affords rural locations the opportunity to offer a course in Japanese taught by a Japanese teacher. It can link students from a number of countries in a dialog about global issues such as destruction of the rain forests or global warming.

On example: During the invasion of Kuwait by Iran and the subsequent allied intervention of Operation Desert Storm in 1991, school children in Kuwait, Iran, and other neighboring countries were able to get messages out via telecommunication lines. Students from the United States and other countries accessed the telecommunications lines using a computer and modem, and were able to receive first-hand accounts of how the conflict was affecting the lives of real people—and real students—in the Middle East.

For students with disabilities who often do not read a newspaper or listen to news reports, this link to the world via computer and modem is bringing news into their home, sometimes even faster than conventional news sources. Being able to converse with a peer in another part of the world is a powerful learning tool, and it allows students to share something, however small, about their world with the person at the other end.

Important skills are developed by distance learning. Students must be able to communicate using written language, although they need not have perfect language skills. Students can generally understand fairly easily messages from a foreign student who has learned English as a second language. However, communicating via the computer screen can often be motivation enough for a student to improve his or her language skills. This is especially true if a printout of the conversation is made and discussed at a later time. Research indicates that when students communicate with their peers, they write with greater care, edit what they write, and plan more extensively.

Distance learning also improves critical thinking skills because it forces students to think as the conversation unfolds and to analyze the information as it is being shared. They must also be informed about current events in order to discuss knowledgeably topics with students in other parts of the community, state, country, or world.

How Teachers Benefit

Teachers as well as students can learn about what is happening in their field and in the world. Teachers can go on-line and seek advice from colleagues who have experienced a similar difficulty reaching a student with a specific type of disability, or get help in individualizing a particular learning experience. This improves teaching skills and provides better learning situations for students.

Students with physical disabilities frequently do not have the opportunity to benefit from learning experiences outside the classroom because of accessibility issues. Distance learning allows students to overcome this obstacle, allowing them to communicate and seek opportunities for learning that are limited only by their enthusiasm and their grasp of the technology.

Research indicates that when students communicate with their peers, they write with greater care, edit what they write, and plan more extensively.

One of the most important barriers that is eliminated by distance learning via computer is that of prejudice and discrimination. When two or more students are communicating over a bulletin board system or other telecommunication network, physical appearance, speaking, and cognitive abilities are camouflaged. Frequently, unless the student reveals his or her own disability, peers on the other end of the communication have no idea if the person they are speaking with is disabled. This freedom to interact on a totally equal basis without hidden or overt prejudice or discrimination boosts students' self-esteem and often leads them to levels of achievement previously unattainable.

Conclusion

Technology has helped open new paths of learning for students with disabilities. It can individualize instruction, make educational material more accessible, and help students

learn at their own pace and style. It also gives students the opportunity to interact with peers on an equal basis within the classroom and beyond.

Unfortunately, technology in school is too often limited by a lack of hardware in the classroom where on-going learning takes place, and lack of knowledge and experience by teachers. Hardware should be available in each classroom, not just "the computer room," and there should be enough workstations so that only two or three students will have to share one. In this way, students can work throughout the day, raising their skill level through increased exposure to the technology.

Teachers must be consulted prior to decisions about the use of technology in the classroom. They must be fully trained if they are to achieve a "comfort level" with both the hardware and the realization that their role may change from teacher/lecturer to teacher/facilitator without resulting in "losing control" of their classroom.

The implications of emerging technologies on students with disabilities are far reaching. Teachers and students must continue to use current technologies, experiment with emerging ones, and take advantage of the great opportunities for individualization and skill improvement that technology offers.

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An LRE Resource Directory

JULIA GOLD

Where can you find those award-winning mock trial materials you heard about at a recent conference? Where could you look for that new interactive video on the Supreme Court? One place might be a Resource Directory database developed by the University of Puget Sound Institute for Citizen Education in the Law (UPSICEL)

The Directory is designed to allow teachers, students, and attorneys to sort through more than 1,000 entries consisting of lesson plans, law-related computer software, videos, and reference materials. The Directory has been designed for novice users, and includes a "Help" screen to guide users through the search process. Each entry is described in some detail, and includes cost and ordering information.

The materials included in the database are national in scope, including materials from many state LRE projects, the American Bar Association, the Constitutional Rights Foundation, the Center for Civic Education, the National Institute for Citizen Education in the Law, and many commercial publishers, including Interact, West, and Greenhaven Press.

Users can search for materials by author, title, subject area or keyword. For example, if someone interested in teaching about Brown v. Board of Education typed in the name of the case, the following materials would appear, along with the cost and how to order them: "Interpreting the Law: The Role of the Supreme Court," a video by Time Magazine; "The Pursuit of Justice—A History of Our Constitutional Rights," a video by ACLU of Delaware; "The Road to Brown," a video by California Newsreel; "Supreme Court Decisions that Changed the Nation," a video distributed by Social Studies School Service; and Great Trials in American History, a book including lesson plans by NICEL.

The Directory is contained on one 3½ inch diskette and is available for both IBM and Macintosh computers. IBM or IBM-compatible users need 640K or more of RAM, and at least 2 Mb hard disk space, a 3½ inch high capacity (1.44 Mb) floppy drive, a VGA monitor, and an IBM or Microsoft compatible mouse, and DOS 3.3 or higher. Note: Some non-VGA computers may be able to run the program using a monochrome version which is provided. This includes computers such as the IBM PS/2 Model 25 (8086 processor).

For Macintosh users, the software will work with the Macintosh Plus, SE, LC, Macintosh II or Macintosh Classic. Mac users will also need Hypercard 2.0.

The package includes a guide that explains how to install and use the software, and one 3-inch diskette. The package costs $25.00, which includes shipping. For more information, contact Julia Gold, UPSICEL, UPS School of Law, 950 Broadway Plaza, Tacoma, WA 98402-4470, 206-591-2256.

Julia Gold is Deputy Director of the University of Puget Sound Institute for Citizen Education in the Law.

Tapping into Law-Related Information

JULIA HARDIN

Electronic databases and bulletin boards are making it possible for teachers to research cases, locate the latest law-related resources and share creative teaching ideas. With the aid of a computer, communications software, a modem, and a telephone line, educators can put together a lesson plan, search for cases on a particular topic, view and print out the text of a historic speech, or send a message or comment to another teacher thousands of miles away.

The Center for Research and Development in Law-Related Education (CRADLE) located at Wake Forest University Law School offers three ways to take advantage of technology to enhance teaching: (1) LREnet; (2) lessons on computer disk; and (3) interactive video programs.

LREnet

An electronic database and messaging system, LREnet is the gateway to hundreds of lessons, case summaries, speeches, and primary documents in the Warren E. Burger National Repository for Educational Materials on Citizenship and the Constitution at CRADLE. Teachers can also send and receive messages to and from other teachers all over the country and participate in conferences on selected LRE topics. Free access has been made possible through a grant from the U.S. Department of Education.

The requirements for accessing LREnet are:

- any computer—Apple, Macintosh, or IBM PC compatible;
- a 1200-or 2400-baud Hayes-compatible internal or external modem (most modems are Hayes-compatible, but check its specifications to be sure; reliable modems are available for $90 to $160); and
- any communications software (popular programs such as ProComm Plus, Relay Gold, Smartcom, Qmodem, and Crosstalk range in price from $59 to $299).

Users will also need the use of a telephone line. With most modern phones, one can connect the modem line to the phone itself, so that the line can be used for either voice or data communications (but not both at the same time). The alternative is to connect the modem line directly to a phone jack. LREnet supports 1200 or 2400 baud modem speeds with 8 data bits, 1 stop bit, and no parity; make sure that the communications software is configured to operate with these settings.

Use of LREnet involves no cost to the user—there are no long distance telephone charges, either. LREnet is available 24 hours a day, seven days a week. CRADLE invites comments about the system and suggestions for its improvement, and changes are made regularly to improve the system's "user-friendliness."

The only limitation is that users are allowed only 30 minutes per day on the system. Without the time limit, the number of different users able to access the system would be severely curtailed.

To register with LREnet for the first time, direct the communications software to dial LREnet at 1-800-2LRENET (1-800-257-3638). When the computer program indicates that it has connected with LREnet, you will be asked to choose a password for future logins and answer a series of questions, such as what protocol you wish to use for file transfers. You will eventually see the main menu screen, from which you can activate any of the LREnet services including sending someone a message, reading messages sent to you, viewing lesson plans or other resources, or entering a conference.

For those unable to access LREnet, all of the lessons in the National Repository are also available on paper (average cost: $1 or $2 per lesson) or on floppy disk ($5 for up to 20 lessons per disk—Apple, Macintosh, or IBM-compatible; 3.5" or 5.25") in text/ASCII or a variety of word processing formats (Wordperfect, Microsoft Word, etc.).

If you have access to a laser disc player and a Macintosh that interfaces with it, you can take advantage of the control and flexibility made possible by newly-developed interactive video materials. Interactive laser disc is a rapidly growing field, despite the relatively new nature of the medium and its cost—approximately $350, not including the cost of the player and other equipment.

Interactive programs are a creative resource for visually-stunning and intellectually-challenging classroom or individualized study. Access to a laser disc full of both archival and new video material concerning the U.S. Supreme Court and constitutional history can be controlled with a new Hypercard program developed by ABC News Interactive in cooperation with CRADLE and with the support of the Commission on the Bicentennial of the U.S. Constitution.

Control of the material is in the user's hands. Segments of the video and the software program may be shown in any order desired, allowing the user to choose clips of Madonna speaking on freedom of speech, watch a Ku Klux Klan marcher, or combine pictures of the Founding Fathers with a text overlay that you have typed in yourself. Students can also prepare reports using the video and software.

A special feature of the ABC News Interactive Video is a section created by CRADLE teachers on student rights, "The Supreme Court Challenge." Students are presented with four scenarios involving such issues as search and seizure at school, blood testing for AIDS, and high school journalism. Using Supreme Court decisions and all the other resource material in the video and software, students are challenged to prepare arguments for both sides in each scenario.

Use of the laser disc requires the following:

- Macintosh computer with laser disc player interface (an IBM-compatible version will be available in the future);
- laser disc player with Macintosh computer interface (Pioneer and Panasonic offer models priced at approximately $700); and
- television/video monitor.

Another interactive program which will focus on the Electoral College is also under development by CRADLE.

For more information on LREnet or any of the other services described above, contact CRADLE, Wake Forest University School of Law, 2714 Henning Drive, Winston-Salem NC 27106, 1-800-437-1054 or 919/721-3355, fax 919/721-3353.

Julia Hardin is Executive Director of the Center for Research and Development in Law-Related Education (CRADLE).

Meet ERIC: Grandaddy of Education Databases

JANE HENSON

Created by the U.S. Department of Education, the Educational Resources Information Center (ERIC) was established to serve the nation's educators. Over its 28 year history, the ERIC database, the cornerstone of the ERIC System, has grown to include almost 800,000 records devoted to the literature of education, including model classroom lessons, research reports, assessments of student performance, policy papers, journal articles, state curriculum guides, and conference presentations.

The literature is prepared for the database by 16 clearinghouse sites that are responsible for creating the bibliographic records and abstracts. The ERIC record can be thought of as an expanded library catalog card because it includes author, title, publication date, unique identification number, and publisher information. In addition, the record contains an abstract/annotation, publication type, keywords/descriptors, availability, and may have a descriptive note, target audience, language, contract/report number, and government source.

Accessing ERI

There are three ways to access the ERIC database. The first method employs two traditional paper/printed indexes, Current Index to Journals in Education (CIJE) and Resources in Education (RIE). CIJE is the monthly guide to the current periodical literature in education, covering articles published in almost 800 major education and education related journals. Each guide contains a journal title index, a main entry section, a subject index, an author index, and a journal contents index. CIJE is available from Oryx Press, 4041 North Central at Indian School Road, Phoenix, AZ 85012-3397, 1-800-279-ORYX.

RIE is a monthly guide announcing the recent literature of education and related fields that is not published in jour-

nals. RIE is composed of resumes and indexes. Resumes provide descriptions of the individual documents, including abstracts of the content and appear in the Document Section of RIE. The Index Section provides access to the literature resumes by subject, personal author, institution, and publication type. RIE is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

The second method of accessing the ERIC database is through on-line search services available at most college and university libraries, public libraries, school libraries, and other sites where there is access to a computer, communications software, modem, and telephone. On-line searching provides the most up-to-date look at the ERIC database. To obtain an on-line search, consult with the reference staff at the nearest library or contact one of the 16 ERIC Clearinghouses. On-line searching of ERIC allows for efficient access to the database. Using large mainframe computers, thousands of ERIC records are searched rapidly and accurately. The speed and size of the computers, coupled with the powerful searching capabilities of the software, permits several ideas to be searched, sorted, and retrieved almost simultaneously. This type of high powered searching cannot be carried out using the paper index guides, CIJE and RIE.

The third way to access information in the ERIC database is through compact disk (CD-ROM) technology. This information storage medium can be found at many local libraries, school libraries, and college and university facilities. ERIC's CD-ROM access is personal computer based, with disks and software available from two vendors, DIALOG and SilverPlatter. Software for these products is user friendly and allows individuals to search the database without an intermediary.

Have a Question? ASK ERIC

A new service available from the ERIC System is an Internet reference service called ASK ERIC. The goal of ASK ERIC is to help people retrieve additional information from the database. Using the Internet address, ASKERIC@ERICIR.SYR.EDU, individuals submit their questions and requests. The electronic mail (e-mail) message is read by the ASK ERIC service manager who searches the ERIC database for information and sends the results back to the client using the Internet e-mail network. If the request requires additional information or more in-depth subject expertise, the e-mail message is forwarded to the appropriate ERIC clearinghouse for further assistance. The specific ERIC clearinghouse carries out the follow-up, including retrieving additional records from the databases, identifying leading scholars in a field, providing names of professional organizations that focus on the discipline or subject area, and citing other literature important to the topic.

ASK ERIC has been operational since January 1993 and has received inquiries from all over the world. While the goal of ASK ERIC is to answer clients within two days of receiving their requests, clearinghouses can often provide users with immediate answers to their questions.

For further information on the ERIC Information System or to obtain addresses of its other clearinghouses, contact the ERIC Clearinghouse for Social Studies/Social Science Education (ERIC/ChESS), 2805 East Tenth Street, Suite 120, Bloomington, IN 47408, (812) 855-3838.

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NICELNet: Now Available on CompuServe

WANDA J. ROUTIER

The National Institute for Citizen Education in the Law (NICEL) is now online on the CompuServe Information System, a national/international communications information service that provides users access to a wide variety of information as well as special interest forums. One such forum is the Education Forum. Its subforums or sections serve as electronic bulletin boards and mail facilities for users who post notices (or mail messages) on topics relating to the topic of the forum. In each of the 17 sections in the forum one can find information and queries on social sciences, special and gifted education, language arts, and library media centers. Other sections are for teacher, parent and student exchanges.

If one were to make an electronic "visit" to some of the various sections of the Education Forum, one might observe: teachers "talking" to each other about the merits and demerits of the America 2000 plan and the National Goals for education; a parent seeking information about Attention Deficit Disorder; SchoolNet teachers from Hawaii and Germany communicating with counterparts in Nebraska and Florida on a variety of topics; and, in yet another section, a heated discussion on the effect of television an education.

A key component of the Education Forum is its four libraries which contain a vast storehouse of educational information. Topics include ERIC reports, U.S. Department of Education studies, newsletters from educational organizations, and even lesson plans on everything from math to history. Users can retrieve these documents to their home, school or office computer to print and use at a later time.

NICEL has a section in the Education Forum which allows users to access information about law-related education (LRE). NICEL posts notices about upcoming LRE conferences, NICEL newsletters, lessons and other timely LRE news. In addition, several documents are available online including a mock trial bibliography and LRE materials list. Users accessing these documents can order—directly on CompuServe—everything from OJJDP case studies to a mock trial. An updated list of state, local and regional LRE coordinators is available, as well as four lessons from "Rights of the People," NICEL's curriculum targeting students with disabilities. The four lessons are on the topic of the U.S. Constitution and Bill of Rights and feature a mock constitutional convention.

Teachers can leave electronic mail for NICEL staff in much the same way as messages are left on a telephone

answering machine. NICEL staff can answer questions, join with teachers in a dialog on a specific topic, discuss mock trial strategies, share methods that worked well with their students, or seek advice about teaching a case or lesson. Future plans include offering additional lessons and adding national conferencing online to allow educators from around the country to talk together online, exchanging views in much the same way as with teleconferencing.

To access NICEL materials in the Education Forum, use the key word search "NICEL." Other key words are "law-related education" and "LRE." Checking all three key words will ensure access to all NICEL materials. Direct access to NICEL through e-mail is available by leaving a message at 71022,1724. For an introductory packet which includes free time online with CompuServe, phone Wanda Routier at NICEL, 202/546-6644.

Wanda Routier is Program Director, Law-Related Education for Students with Disabilities, National Institute for Citizen Education in the Law (NICEL), Washington, DC.

Welcome to WESTLAW

BETH WILSON

WESTLAW is a computer-assisted legal research service consisting of more than 3,000 databases, including federal and state court cases, the U.S. Code and state statutes, federal regulations, administrative law decisions, topical databases, legal periodicals, West's Insta-Cite, West's QuickCite, Shepard's Citations, Shepard's PreView, Black's Law Dictionary, DIALOG on WESTLAW, as well as gateway access to Dow Jones News Retrieval, VUTEXT and more.

Available 24 hours a day with daily online additions, WESTLAW is the only such service that includes synopses and headnotes prepared by lawyer-editors with the full text of federal and state court decisions.

WESTLAW gives its subscribers the ability to search for information in several different ways. Subscribers can use word searches to search databases, or perform searches using Key Numbers or digest topics from West's familiar Key Number System.

WESTLAW can be accessed using WALT PC, a customized personal computer designed for WESTLAW access, or any of over 200 kinds of personal computers, local area networks, mini-computers, or terminals. WALT PC features include automatic sign-on, one-touch function keys for frequently-used commands, and 9600 bps transmission speed. WESTMATE software customizes many popular computer models for faster, easier research.

WESTLAW's Full-Text Plus includes the addition of headnotes and synopses to the full text of the decisions on WESTLAW; changes made by judges to their opinions after initial publication; corrections to spelling, grammar, and citations; and the addition of parallel citations. The addition of headnotes and synopses increases the number of search terms available to the computer and, therefore, increases the chance that a precedent will be found. For example, if the term *dermatologist* is found in a case, the search term *physician* is included in the headnote. If the researcher can't think of the word *dermatologist*, the word physician will find the case.

Full-Text Plus also gives users the option of reading cases in their entirety or saving online time by simply skimming the headnotes and synopses. WESTLAW is the only commercial computer-assisted legal research service to offer the benefits of Full-Text Plus.

Topical Databases and Specialized Materials

WESTLAW contains over 30 topical database groups, which cover topics such as tax, securities, bankruptcy, labor, and insurance. Most topical groups include databases for case law, statutes and regulations, administrative law, texts and periodicals, and other information pertinent to the researcher seeking information in those fields.

Researchers may also use WESTLAW to find information from specialized sources such as DIALOG, Practising Law Institute, BNA Tax Management Portfolios, and State Net, as well as gateway access to Dow Jones News Retrieval, VUTEXT, Dun & Bradstreet, and PaperChase.

Ten WESTLAW State Bulletins and the WESTLAW Supreme Court Bulletin are updated daily with summaries of recent cases, statutes, legislation, and administrative materials of significance for a single state. Commerce Clearing House Inc. (CCH) daily prepares abstracts of federal tax developments originating in the White House, Congress, Treasury, IRS, or Judiciary. These abstracts appear in CCH Tax Day: Federal. The various Bureau of National Affairs (BNA) databases are also updated daily.

Simplified Searches

EZ ACCESS is the new menu-driven approach to using WESTLAW. Common research tasks are simplified with EZ ACCESS, allowing first-time and occasional users to use WESTLAW effectively without the need to memorize commands or database identifiers. EZ ACCESS guides the user through the query formulation process, automatically selects the proper database, and retrieves documents by title, citation, West Topic and Key Number, or through the use of significant words and phrases. EZ ACCESS also allows simplified access to the four citator services.

Training and Support

West Services, Inc., a subsidiary of West Publishing Company, offers both individual and group training for users with instruction available either in-house or at one of a growing number of WESTLAW Training Centers. Another option is a PC-based training program called PC-WESTrain II.

A staff of reference attorneys and customer service representatives are available by phone from 7:00 a.m. to midnight Monday through Friday; 8:00 a.m. to 6:00 p.m. Saturday; and 10:00 a.m. to 6:00 p.m. Sunday. (Central Time.)

Customer Service Representatives are available to explain WESTLAW commands, messages, search techniques, editing, and special features. Reference Specialist Attorneys are also available to answer in-depth questions dealing with query formulation, issue spotting, and new database features.

For more information about WESTLAW, contact West Publishing Company, 610 Opperman Drive, Eagan, MN 55123; (612) 687-7617.

Beth Wilson is a WESTLAW Academic Representative for West Services, Inc.

Energizing Social Studies Through the Use of Technology

DICK RATTAN AND LINDA SPOALES

technology the application of scientific knowledge and advances to practical purposes; any use of materials or objects, as tools, to serve human needs (School Dictionary: Macmillan/McGraw Hill, 1993)

Traditionally, social studies has been a curriculum area quick to embrace technology. At first, technology was considered to be primarily film and filmstrip, record and cassette. Then, with the advent of the videocassette and cable, technology grew to include the monitor and player, and live or prerecorded programs. Today, technology embraces the computer field as well, and a whole new scenario has evolved—that of the multimedia teaching station.

The multimedia station as defined by our school system (Montgomery County, Maryland, Public Schools) consists of several key components. A computer, (in our case, an Apple Macintosh), an LCD panel (liquid crystal display) which projects the computer screen onto a projection screen via an overhead projector, a laser disk player, a CD-ROM player and a printer. Also included are some software programs, laser disks and CD-ROMs . Together, these tools have revitalized today's social studies classroom.

Five years ago, our school district decided to pilot a project involving the use of multimedia with instruction in social studies at the high school level. Initially, four schools were involved. Each school received one multimedia station and selected software packages including HyperCard for authoring, Microsoft Works for database and word processing, and Microsoft Excel for spreadsheets. In addition, ABC Interactive disks The '88 Vote, Martin Luther King, Jr. and In the Holy Land, as well as National Geographic's GTV were purchased. To make good use of these components for instruction, teachers in the pilot schools needed to be trained. Thus, the idea for the "MacPac"was conceived.

The main idea behind the "MacPac" was simple—teach instructional leaders to develop and use technology-driven social studies lessons with the expectation that they become the trainers for their respective departments. This project was unique because it began with participants who were not technologists. These participants (pairs of teacher from each school—the department head and one teacher) received an initial two-week training in the summer. Computer basics as well as HyperCard authoring were taught. The expectation was that each participant would create a HyperCard stack to be used with his/her class in the coming school year. So far, over 35 products have been created as a result of these workshops. The titles vary greatly and span the curriculum. Throughout the year, follow-up support was available through scheduled professional days and informal networking among the participants.

The pilot proved to be so successful that in each of the following years, additional schools were added. This summer, the remaining five high schools in the county will receive multimedia teaching stations, bringing the total number of schools involved to 21. As new middle schools have been constructed and older middle schools renovated, they too are receiving these stations. In addition, middle schools are developing their own programs as a new "MacPac" emerges—the "Middle School MacPac."

As original "MacPac" members, we can see how computer-assisted instruction has enabled us to teach social studies the way we feel it should be taught—through the use of primary sources. Traditionally, to present a class with a variety of primary sources would entail much chaos. Readings could always be photocopied, of course, but with dwindling resources, this is not always the best use of paper. The trusty opaque projector could be lugged into our classes and set up, but then clarity of projection is not always dependable. Another alternative would be to distribute copies of different texts to the students—providing, of course, that class sets are available. However, much class time is usually lost in the transition among books and pages. By creating a HyperCard stack, we are able to access many resources with the click of the mouse button. The sequence of information is dictated only by the direction which the class is taking.

We can see how computer-assisted instruction has enabled us to teach social studies the way we feel it should be taught—through the use of primary sources.

Our ninth graders become historians as they view primary sources relating to the causes of the American Revolution. During one class, students might be studying the colonists destruction of property as a reaction to British imposed laws. Students view paintings (via the LCD) of the Boston Tea Party, analyze a diary account by an actual participant and then discuss the discrepancies and similarities between the two. Another day, the lesson may be about different perspectives, and students will read accounts from both British and American newspapers relating the events which occurred at Lexington and Concord.

With ABC's Martin Luther King, Jr. laser disk, students in our classes have been introduced to the human rights unit by viewing of a collage of images showing scenes from the civil rights movement of the 1950s and 1960s. With their interest piqued, some students completed their study of this unit by creating their own multimedia timelines depicting major milestones of the human rights movement. Other students created a biography of Dr. King's using a HyperCard stack as their basis with links to the laser disk.

Instructional technology has also allowed us to easily update materials. Information on the breakup of the former Soviet Union and the resulting political chaos has been available to our students since the fall of 1991. With ABC's *Communism and the Cold War*, students were able to study primary resources and see first-hand accounts of the demonstrations that followed during and after the attempted ouster of Gorbachev. Additionally, students were able to put together their own presentations chronicling the origins, course, and end of the cold war—all through the use of one laser disk program.

After having worked with the "MacPac" and having seen the way in which it enhances the ability of many different types of students not only to be successful but also to experience a sense of fun and pride in their achievement, we decided that this was a learning tool that all teachers needed to be familiar with. To that end, we formed a company, Fife and Drum, Inc. to provide consulting and training for schools and software development of materials for social studies teachers. Our current project is the development of a CD-ROM to support the Maryland Test of Citizenship skills for CLREP (Citizenship Law-Related Education Program for the Schools of Maryland) and a followup CD-ROM of United States citizenship in general.

Finally, what is it about computers that energizes the social studies classroom of today? We have discovered that this medium tends to bridge all learning styles and helps ensure that the information to be learned has reached every student. Our experiences have proven that, no matter what course we are teaching, the instructional use of computers has enhanced our effectiveness in helping to motivate students to become lifelong learners.

Dick Rattan is Chair of the Social Studies Department at Watkins Mill High School, Gaithersburg, MD. Linda Spoales is a Teacher/Specialist in the Department of Academic Programs for the Montgomery County (Maryland) Public Schools.

Interactive Law-Related Education: Making Students Part of the Action

DON KING

One of the most exciting new high tech LRE products on the market is "The Interactive Courtroom," an interactive video produced by the Stanford Law School and marketed by the CLE Group of California under the direction of David Arfin. This eight part series helps students hone a variety of trial-related skills, including interviewing, making opening statements and closing arguments, and making motions and objections. It uses two separate trial scenarios: one a breech of contract by a young rock group and the other involving an accidental death of a surveyor.

These programs are useful for training middle school through law school students. The videos feature teens as witnesses and use student-driven learning as a methodology that appeals to teenagers.

Interactive video gives students an opportunity to view courtroom techniques, to see the application of legal principles, and to actually participate in the legal process. It is much more meaningful to learn to recognize hearsay as it is being offered by a witness than it is to read it from a textbook.

The interactive video is a vast improvement over traditional computer-assisted instructional programs, according the University of Louisville Associate Professor and Law School Librarian David J. Ensign, because "it places students in a setting that closely approximates a real-life setting." Students can determine the technical ground rules for the proceedings by accessing either the federal or California rules of evidence.

Pluses and Minuses

While interactive videos are a useful supplement to traditional course work for some subjects, they are less useful for others. Lessons currently available from Harvard and Stanford concentrate on a few topics, notably evidentiary objections.

Another drawback is that lessons cannot be accessed by more than one student at a time, or at most by a small group of students sharing the same workstation. This makes it necessary to have more than one workstation available and to purchase additional copies of the required exercise.

Interactive video gives students an opportunity to view courtroom techniques... and to actually participate in the legal process.

Other LRE interactive videos include the Harvard Interactive Courtroom and an ABC interactive series on Dr. Martin Luther King, Jr., the Supreme Court, and the Power of the Presidency. Disks in the ABC series range in price from $95 without driver software to around $300 with the driver software. Each of the eight "Interactive Courtroom" lessons cost about $350 per lesson to lease.

Equipment Requirements

The Stanford Series will work with either the Panasonic

4200 or the Sony 1500 Laser Disk Player. While both the Stanford and Harvard Series can run on an MS-DOS system as minimal as 8088 with only a floppy drive and open serial port, better results are obtained with a hard drive. In using the packages here at Central High, we have experienced difficulty with Terminate and Stay Resident Programs (TSR). Both packages have serious trouble with any TSRs and seem to prefer to be on a dedicated system.

To utilize the Macintosh with the Stanford Series, we used a package called Soft PC (cost: $195) that sets up a DOS partion on the Macintosh hard drive. System requirements are minimal, but using this package on anything less than a Macintosh SE is not recommended.

Conclusion

The Interactive Courtroom teaches high school students correct trial procedure. It has made a significant difference in student mastery of trial skills and helped an Central High's inexperienced mock trial team advance to the final round of the Metro Division of Mock Trial Competition.

Don King is Coordinator, Legal/Government Services Magnet, Central High School in Louisville, KY. *The author acknowledges the assistance of David J. Ensign, Associate Professor and Law School Librarian at the University of Louisville School of Law, and Ms. Jana Tobey Hickey, Computer Education Support Teacher, Jefferson County Public Schools, Louisville, KY.*

Using Interactive Television to Bring LRE to Rural Schools

JAN HARPER

With commitment, creative thinking and approximately 60 miles of fiber optic cable, seven school and educational service districts in Michigan's rural Shiawassee County can now participate in such staple LRE activities as mock trials and moot courts. It is made possible by interactive television, which allows students who are miles apart in as many as four different locations to share a teacher and classroom experiences. Interactive TV makes it possible for high school students as well as adults living in areas where law-related education had previously been unavailable to access and become full participants in a wide range of LRE experiences.

Located approximately midway between Flint and Lansing, Shiawassee County's interest in interactive television grew from a need felt at the local school district level where small school systems did not have sufficient enrollment to offer many of the courses which students wanted or needed.

How it Began

In 1986, a committee representing school boards, teachers, and administrators began to research options for delivering a broader curriculum to students. A variety of courses were offered throughout the county and attempts were made to transport students to the courses offered at other schools. As it became obvious that the time spent by students riding buses was becoming counter-productive, attention turned to interactive television as the most feasible option.

The decision to share equally the cost of installing the $650,000 fiber optic system was made by the local districts three years later. Representative committees developed budget, construction specifications, operation policies, and contract language. A county-wide interactive TV addendum was negotiated, ratified, and added to each of the seven different existing teacher labor agreements, and the Shiawassee Interactive Television Education System, named S.I.T.E.S., became operational in January of 1990.

Courses taught on the system may be requested by students or teachers at any of the sites. Any course will be taught if there is sufficient student interest, and classes have been taught with as few as eight students. Maximum course enrollment may not exceed 24, however, and each classroom is limited to no more than 12 students.

When barriers to teaching and learning process do arise, teachers and students have found ways to adapt processes to the new technology. Using fax machines and telephones, teachers and students have discovered exciting new avenues for teaching and learning.

How it Works

The classrooms or learning labs in each of the schools have four ceiling-mounted television monitors which are visible from the teacher's podium. The instructor can channel into view any of the other six districts almost as easily as changing channels on a television set. Classrooms may be linked together in any sequence, allowing simultaneous transmission of three or four different classes to different locations.

Teachers can see and monitor one to three classrooms on televisions as well as being able to view students who are located in the transmitting classroom site with the teacher. The fourth monitor allows the instructor to view what is happening at the teaching station exactly as students see it.

Students view distant classmates on three monitors housed in a console at the front of the classroom. Voices are transmitted instantaneously through sound activated microphones which are attached to the student worktables and the teaching podium.

Three fixed classroom cameras in each classroom can be switched using simple push buttons on the teaching podium. One camera is focused on the person at the teaching station. Another camera is focused on students in the classroom. The instructor may switch on this camera so receiving students can see classmates who are speaking rather than viewing the instructor.

At remote sites students must remain within range of the classroom camera unless the instructor directs them otherwise. Because students can be seen as well as heard, additional teacher supervision at a distant site is unnecessary. A third camera may be used to focus on the instructor's desk top where illustrations may be shown, manipulatives may be demonstrated and printed material may be placed for student observation. This "pad camera" is the technological chalkboard of the interactive classroom.

The fiber optic cable also transmits fax messages and telephone communications to each of the classrooms. Tests, homework papers, lessons, and instructions are faxed to and from the students and teacher.

Confidential communication about student progress is usually conveyed via telephone. Some evening time is set aside so parents can discuss their child's progress using the interactive technology in their local school. The teacher also visits and teaches from receiving sites periodically.

Instant audio and video transmission bridges the distance barrier. Students and teacher communicate as if they are physically in the same room. The instructor involves students in discussion, students ask questions, and students engage in cooperative learning activities with classmates who may be twenty miles away.

LRE Enters the Picture

Law-related education was introduced to distance learning in 1991 when the district's practical law course was first taught via the interactive system. LRE proved to be a natural for the system, allowing students to take stands on controversial law-related issues, develop arguments, debate, and examine court decisions.In the fall of 1992, the interactive television law-related education class was offered to adults wanting the course for enrichment or credit toward a high school diploma. Like the younger students, the adults liked being involved in the active lessons. Not surprisingly, however, it took the adults longer to adjust to the technology.

Conclusion

Technology has opened the schoolhouse door to law-related education for students and adult learners in rural areas. The Shiawassee experience has demonstrated that law-related education via interactive television can be equally as stimulating as that conducted in a regular classroom.

Jan Harper is a teacher at Durand High School, Durand, MI, and is a trainer for National Institute for Citizen Education in the Law.

Celebrating Law Day Via Satellite

MARJORIE J. MENZI

Alaska took its Law Day celebration to new heights in 1992 with a unique event that was literally "out of this world. In an hour-long program entitled "Capital Exchange," high school students throughout the state were able to talk to Senator Ted Stevens in his Washington, D.C. office via a special satellite link-up.

Using Law Day packets and the 1992 theme, "Struggle for Justice," students and teachers prepared for the discussion prior to the program. The Law Day issue of the ABA's *Update on Law-Related Education* magazine was also made available at all sites.

Students developed questions on national issues having constitutional implications. One issue raised was the opening of the Arctic National Wildlife Refuge on Alaska's far north slope for oil exploration. Students asked Senator Stevens how it would affect the native population both economically and culturally and what impact it might have on the environment.

Totally funded by Senator Stevens, the program was two-way audio and one-way video. Students received a video transmission from Washington via satellite while Senator Stevens was connected by audio links to sites as remote as Barrow, Hooper Bay, and Mountain Village.

Many of the students were members of the Yuipk and Inupiat Eskimo groups, living in remote villages—some with populations of less than 100—where the "legal system" sometimes consists of nothing more than itinerant magistrates and law enforcement personnel.

The experience of being able to communicate directly with their senator was a novel experience for these students, giving them a special opportunity to learn more about contemporary application of the Constitution and to celebrate Law Day in a meaningful way.

Marjorie J. Menzi is Co-Coordinator of the Alaska Law-Related Education Program.

Getting the Goods: High-Tech on a Low-Budget

HARRY GARVIN

If you're sold on using technology in the classroom, but wondering how to find or finance it, here are some ideas to help you get started.

Military Bases

With the federal government in the process of phasing out selected military posts and bases in the United States, this is a good time to inquire about surplus items that could be put to use in LRE programs.

Here at Savannah High School, for example, we were able to obtain a rear screen projection system two years ago from the Army Education Center at Hunter Army Airfield in Savannah, GA. When such items are declared as surplus, they are listed at each military base on the "United States Government Surplus List." While each installation publishes a list of these surplus items, some pool their efforts to publish a list for a general area or region.

Step one is to phone the installation and ask for a copy of the list. As non-profit institutions, schools generally stand a better-than-average chance of obtaining these surplus items. And, with luck and cooperative base personnel, you may even be able to get help from military volunteers in setting

up the equipment, as we did with our "new" rear screen projection system.

Legal Research Services

For law magnet academies or law-related education programs, one excellent resource is WESTLAW, an on-line computer-assisted legal research service (see the article on page 14 for more information about WESTLAW). There are many sources of funding available to support such a system for educational purposes. However, be aware that while federal grants are available to purchase the system, they will not support the system's ongoing cost.

Write to the United States Department of Education, the Department of Commerce, or your state department of education and ask for a list of grantors (not necessarily federal) who make funds available for educational projects. The list may include grantors who provide funds of up to $10,000 for educational projects. If your request is modest, an informal grant proposal is well worth the time and effort.

Business Community Support

When searching out funding sources, we often tend not to look in our own backyard. In fact, many civic minded local corporations and industries are eager to support educational efforts. In addition to approaching established companies, contact your state's department of industry and tourism to request an annual list of major industries moving into your state. A new industry is more inclined than an established company to provide funds because it probably has not yet been approached by many local charitable organizations and it looks forward to receiving favorable publicity in its new location.

Local cable companies, television stations, telephone and cellular phone companies, and computer/software companies are all natural sources for in-kind donations. Businesses may also be willing to donate outdated equipment when they purchase a newer generation of computers.

Bar Associations and State and Local Government Partnerships

In an attempt to garner support for our Legal Magnet Program at Savannah High School, we have undertaken a variety of activities. One example is Georgia Government Day, which honors members of our local delegation to the Georgia General Assembly. Part of the day is devoted to a school program and tour of our facilities; senators and representatives also serve as guest speakers for classes. Legislators are invited to join us for lunch in our moot courtroom. We use the opportunity to promote law-related education and cultivate possible sources of funding for our programs.

On Law Magnet Day, we invite parents and other members of the community to observe our classes and tour our facilities. Our partnerships with the Savannah Bar Association and the Savannah Police Department give us opportunities to promote our programs through their newsletters and other publications. Legal magnet faculty also attend national, state, and local conventions and programs, to make others aware of our programs.

Assistance for law-related education programs is available from a variety of sources, some obvious and others not. To get the support (and the goods) your program needs requires creativity, hard work and determination.

Harry L. Garvin is Legal Coordinator at The Business, Legal, Financial Professions Academy at Savannah High School, Savannah, GA.

Cable in the Classroom

ELLEN A. SIMS AND DENNIS A. URSO

Television, once described as a "vast wasteland," is one area of technology which, when used creatively, can stimulate students to become more active participants in the educational process. While debate continues in some quarters over the proper use of television in the classroom, forward-thinking educators are exploring ways to use television to enhance, rather than replace traditional methods of teaching.

Peters Township School District, located approximately 15 miles south of Pittsburgh, is forging new horizons in video technology and distance learning by tapping the resources of local businesses and the community to produce its own version of Whittle Communication's "Channel One" service. Through a partnership with Adelphia Cable Communications and Peters Township Community Television, the school district has access to equipment and technical assistance to develop curriculum-based productions.

Adelphia is the primary cable provider for the municipality of Peters Township. In the late 1980s, the township established a cable television board to begin exploring ways to develop programming for the local public access cable channel. With support from Adelphia, the Township purchased cameras, video editing machines and other equipment to establish a production studio.

The decision to house the studio in the local high school was made early on to provide the school district with easier access to the equipment and to encourage students to become active in producing programming for the public access channel.

A Company's Commitment

As a charter member of the national Cable Television Alliance for Education, Adelphia Cable Communications was committed to the development and use of quality cable programming to enhance classroom education. The cable company wanted to demonstrate "that cable television can have a substantial positive impact on education by encouraging the development and delivery of programs which inform and educate," according to its president John Rigas.

Adelphia embarked on a major educational initiative known as Cable In The Classroom. The cable company agreed to commit to the school district the resources neces-

sary to incorporate cable programming into daily lesson plans. In the spring of 1990, Adelphia began wiring every building in the Peters Township School District for cable access, including five school buildings and the administration building. Adelphia also installed a signal modulator in each building so that programming could be broadcast live from each of the six sites. The school district, in turn, began dedicating federal grant monies to purchase televisions for all classrooms in the district.

Through the Cable Television Alliance for Education, cable television networks such as Arts & Entertainment and CNN Newsroom began providing free, non-commercial program and curriculum-based support materials to assist teachers in using the programs in the classroom. The Cable In The Classroom initiative also gives school districts copyright leniency so that programs can be videotaped and replayed when appropriate. Soon, teachers in the Peters Township School District began using these resource materials as part of lesson planning.

From Passive Learners to Active Participants

While this use of video and support materials brought a new element into the classroom, students were still basically passive learners in the educational process. The school district was faced with the challenge of changing students from passive observers to active participants. The key was the unique cable/video partnership which had been building between the school district, the municipality and Adelphia Cable. Through this partnership, the school district developed a local "teleteaching" program, whereby educational programming is broadcast throughout the school system via the local cable access channels.

The aim of the program is to foster interaction between the broadcast and receiving sites using cellular phone links.

The aim of this program is to foster interaction between the broadcast and receiving sites using cellular phone links. The school district approached Bell Atlantic Mobile Phone, a provider of local cellular phone service, to solicit use of cellular phone lines for the teleteaching initiative. Bell Atlantic agreed to lend the district the phones and lines on an as-needed basis for teleteaching programs.

The First Broadcast

Peters Township School District premiered its pilot teleteaching program in March 1990 with a live broadcast of a mock trial as part of a social studies unit on law-related education. Until that time, law education in Peters Township had been concentrated at the eighth and ninth grade level social studies classes, although there was some basic introduction to the subject at the elementary level. The teleteaching program adapted an eighth grade social studies unit on law for fourth and fifth grade classes throughout the school district.

The mock trial was a civil suit, involving a personal injury claim. The trial was titled "Humpty Dumpty v. Sherman King." The premise of the suit was that Dumpty, who had been hired to perform at King's car dealership, had fallen and cracked his head while working for King. While the eighth grade students played the various parts in the courtroom, the actual verdict in the case was determined by a group of 12 fourth and fifth grade students who were transported to take part in the broadcast.

The teleteaching program provided a two-tiered learning experience for students. At one level, the eighth grade social studies class gained a better understanding of the law unit by performing the mock trial, while at the elementary level, students were introduced to the concepts of judicial proceedings. The teleteaching initiative lends itself to interdisciplinary experiences. One of the main goals of the concept is to enhance comprehension skills and to encourage students to develop critical thinking skills.

Also on hand for the program was a local attorney, Kris Vanderman, who served as a consultant for the trial. Mr. Vanderman explained various legal points of the trial to the fourth and fifth grade jury before dismissing them to deliberate the verdict. While the jury deliberated, Mr. Vanderman and the eighth grade students fielded questions phoned in from the elementary schools. At the receiving sites, each elementary classroom also deliberated a verdict for the trial. The votes were tabulated during the live broadcast.

New Possibilities

The success of this initial program prompted the school district to explore a variety of uses for the teleteaching initiative. Frequently, an assembly or program is limited to students in one building due to the logistics of transporting students to various sites, combined with scheduling conflicts and other problems. Teleteaching, however, presented the district with the opportunity to make better use of community resource people by increasing the availability of guest speakers and changing taped presentations to active learning experiences. Teleteaching programs would permit groupings of guests to stimulate discussions and interaction, as well as reducing travel, simplifying scheduling, and easing time constraints.

Following the broadcast of the mock trial, faculty and administrators from Peters Township School District met with David Travaskis of the Temple/LEAP program at Temple University and community law enforcement officials to discuss future video project ideas. Again the partnership with the municipality played a role in the development of the second law-related teleteaching initiative. Peters Township was in the process of establishing a Youth Commission to deal with juvenile offenders and was looking for ways to publicize information about the juvenile justice system to parents and students. At the same time, a unit on juvenile justice was in the planning stage for the social studies classes.

"Juvenile Justice: Educating Students About Their Rights and Responsibilities" was broadcast in February 1991 to eighth and ninth grade social studies classes in the Peters Township School District. The program was the result of over two months of pre-production and classroom preparation. Prior to the broadcast, two eighth grade students videotaped a tour of the Westmoreland County Regional Youth Services Center and interviewed the Director of Juvenile Probation/Detention for the Center, Lawrence Mason. The students also traveled to the Washington County Courthouse to videotape an in-depth interview with the Honorable Thomas J. Terputac, Judge, Court of Common Pleas—Juvenile and Civil Division.

Prior to the actual broadcast, students in the eighth and ninth grade social studies classes discussed common juvenile problems found in their community. The classes developed a hypothetical juvenile case involving underage drinking and vandalism. The teleteaching broadcast opened with a panel discussion about the hypothetical case. Expert panelists included Chief Harry Fruecht, Peters Township Public Safety Director; Judy Hughes, Peters Township Drug and Alcohol Advisory Committee; District Justice Jimmy Ellis; and Dean Kenefick, Intake Officer, Washington County Juvenile Court. The panel outlined how the hypothetical case would proceed through the juvenile justice process, the role of each panel member in that process, and actions that could be taken.

After viewing the two pre-taped interviews at the Youth Services Center and the Court of Common Pleas, students viewing the program had an opportunity to phone in questions to the expert panel. "This teleteaching experience opened up a very important dialogue between the students and the authorities," Chief Harry Fruecht commented. "I think a lot of young people do not understand the full impact that their actions can have. This program not only laid everything on the table, but gave the students an opportunity to raise questions and gain a better understanding of the system."

The Promise of Teleteaching

While some may argue that televisions and television programming do not belong in the classroom, it is important to keep in mind the philosophy of the teleteaching concept: Changing students from passive observers to active participants. Teleteaching lends itself to law-related education by not only presenting the information to students, but providing the opportunity for students to question the system.

School districts must continue to explore the myriad of educational opportunities which are available through community resources. Through teleteaching, we are able to bring these resources into the classroom, stimulating the creative thinking process of our students.

Ellen A. Sims is a social studies teacher at Peters Township Middle School, McMurray, PA. Dennis A. Urso is Superinten-

Using Technology in a Big Way at a Small School

DON SURGEON

Picture, if you will, a high school that has made the use of technology a priority. It leads the state in the use of technology in education and in applying quality practices to education. It has over 100 computers available to students in several different locations: three computer labs, two English rooms, the library, a science room. Each teacher also has his or her own computer

Students use a computer-based, hands-on approach to learning. All assignments must be completed on computer, and most use a variety of software options. Various types of programs are used, including word processing, spreadsheets, simulations, Hypercard, on-line library catalog systems, CD-ROM encyclopedias, video disks, mail systems, educational "games," and optical scanners.

In this high tech high school, "traditional" daily announcements are a thing of the past. Instead, communication is on-going and simultaneous 24 hours a day through the use of electronic mail. As a result, most students are more computer literate than many of the businesses that will hire them or the colleges which they will attend.

Given this impressive array of high-powered technological tools, one might easily assume that our high tech high school is located in a wealthy suburban school district or is a private school in California's Silicon Valley.

In fact, the school is a state-run boarding school in Sitka, Alaska. Mt. Edgecumbe was set up in 1947 as a Bureau of Indian Affairs boarding school for Alaska Natives. After the federal government closed the school briefly in the early 1980s, it was reopened under state management. It now serves approximately 230 students, mostly Alaska Natives and students from small rural communities. Over one-half of the students are "at-risk" students.

I stepped into this high tech environment four years ago ill prepared for it, stricken with a severe case of "computer phobia." So pronounced was my fear that I could scarcely put fingers to keyboard. (I had used LEXIS and WESTLAW to research legal issues, but I didn't think of them as "computers.") When I worked as an attorney for Alaska Legal Services Corporation and the Alaska Public Defender Agency, I heartily supported the use of computers—as long as it was a secretary who dealt with the computer.

All assignments must be completed on computer, and most must use a variety of software options.

It was not until I went back to school to obtain a teaching credential and a Master of Arts in Teaching degree that I was forced to confront the truth: I could not survive unless I learned how to use technology effectively, including computers. I purchased a portable Toshiba computer to use word processing and spreadsheet programs for class notes and projects, and have expanded my use of technology since then. I learned the university mail system in order to communicate with both teachers and students throughout the state. The ERIC system was a gold mine for research and my resulting project, "A Law-Related Education for Alaskans," is included in the system. Despite these achievements, I soon recognized that most of my students have surpassed my computer skills by the time they have completed their first semester of Computer I.

Staging a Mock Trial

Student and teacher use of technology can best be seen by exploring the construction of a Mt. Edgecumbe High School Saturday school. Students at Mt. Edgecumbe attend school on Saturday once a month and this year, three of these Saturday schools were managed by classes I taught.

The first Saturday school, in October, focused on the presidential election. The second, in November, was a United Nations Saturday school. The final Saturday school was the senior mock trial in early spring. All used technology to create an environment for engaging over 200 students in a learning experience. The senior trial best illustrates the process used.

Seniors begin their final year at Mt. Edgecumbe anticipating the senior mock trial. In prior years, they have participated in various mock trials: some in other schools, some in our freshmen "To Kill a Mockingbird" trial, some in our junior Law Day at the Sitka Courthouse, and some in various special trials we hold. For example, this year the freshmen science classes used the principal's mock murder of a senior and the resulting investigation to learn about the scientific process. The end result was a trial of the principal before the entire school on the last day of the first semester, with a local judge and attorneys handling the primary roles. Many choose to take Government second semester so that they can be involved in creating and putting on the trial. Discussions about the trial often take place long before trial work commences.

Many choose to take take Government in the second semester so that they can be involved in creating and putting on the trial.

Work on the trial itself begins five weeks before the trial date. Students first brainstorm various potential trial topics. The criteria for selection includes interest, national and statewide impact, and legal issues that are on the cutting edge of the law. This year, students were closely divided between police brutality and the transmission of AIDS through sexual intercourse. After considering it overnight, the former topic was chosen.

After the law is explained to them, the students are divided into groups of four and each group creates a different fact situation for the problem. They decide when the event happened, where it occurred, who was involved, and what happened. Representatives from each group then meet to pull information from each of the six scenarios to create one fact situation for the trial. This is normally done in the evening with butcher paper sheets spread out on the walls and floor and one student at the computer typing the consensus ideas.

Developing Witness Testimony

Each trial normally has from six to eight witnesses who will testify. Students are divided into witness groups to begin preparing the testimony of each witness. They create the person, list everything they know about this fictional character, and finally develop questions to ask a person who would fill this role in real life.

As part of the process, students research the issues and their character. They may use NewsBank, CD-ROM encyclopedias, and on-line library catalog systems. The latter gives them access to nearly every library in Sitka and most of the libraries throughout Alaska and the western United States, including university libraries. This year's trial touched on police brutality and the use of PCP and extensive information on both topics was available from these different sources.

The student groups then interview experts to complete the creation of their fictional characters. Interviews this year were conducted with police officers, physicians, emergency room technicians, and psychiatrists. The resulting material was used to create affidavits for each of the eight witnesses to appear at trial.

Up to this point in the project, the primary use of technology has been word processing and project planning tools. The reason is that technology is a tool. Students must first complete the factual and legal analyses required to create the trial. Only then do they use technology to enhance the final result.

Now the students are ready to begin using more technology than most lawyers ever use in a courtroom. The witness affidavits, trial script, jury summons, and verdict forms are all done using word processing. They can easily be changed for each trial.

All instructions are created on a presentation program and printed out as overheads. (When the technology for projecting computer images onto a screen or wall become more advanced, the computer itself will be used in the courtroom for this purpose.) Jurors are therefore able to both hear and see each instruction as it is read. The testimony of each witness is enhanced by the use of overheads. Maps and illustrations are created using a drawing program.

The direct testimony of expert witnesses is outlined using a presentation program. A spreadsheet program is used to add graphs and charts. A videotape of the beating may be created to show the jurors what happened, and photographs are taken of the injuries inflicted upon the victim. Finally, a three-dimensional exhibit is planned and created to increase student interest in the trial and to simulate the impact of pretrial publicity on jurors. All of this work is completed during an intense three-week period.

Show Time

On the day of trial, every student and teacher serves on one of the approximately 35 six-person juries which hear and decide the case. Information is presented to the jurors orally and visually, including overheads, slides, and videos.

The trial is videotaped from beginning to end. This gives the students an opportunity to analyze every aspect of it just as a football coach might analyze the play of his offensive line after an important game.

The end result? A day of school that many students (as well as teachers and community resource people) will long remember.

Don Surgeon is a teacher at Mt. Edgecumbe High School in Sitka, AK.

Shining Worlds, Renaissance Exploration, and Stained-Glass Windows

BERTRAM ROBERT COTTINE

We set sail on this new ocean because there is new knowledge to be gained, and new rights to be won, and they must be used for the progress of all people.—PRESIDENT JOHN F. KENNEDY [1]

Technological innovation is not only inevitable; it is imperative. In fact, it will be critical to success in the 21st Century. Once a hardwired calculator with a few advanced functions was the envy of every engineer. Today the microcomputer is ubiquitous. Compared to personal computers of 10 years ago, today's high-capacity computer memories and an extraordinary array of software seem to make every microcomputer's capabilities limitless.[2] Moreover, the technological environment is not static. It is dynamic and constantly evolving. Furthermore, technological innovation occurs in an increasingly competitive international marketplace.

Shining Worlds and The Urge for Certainty

One science reveals the tense interaction between science and the law. We harken back to those days when "shining worlds" or "wanderers" in Greek were the focus of discovery. From the vantage of Newtonian physics and the Voyager photos of the entire solar system, it is easy to conclude that Copernicus was correct about the mechanics of our solar system. From this vantage, it is even easier to conclude that Aristotle and his predecessors were "foolishly" ignorant. But Copernicus did not suggest the earth as the center of the solar system first; Aristarchus, a Greek astronomer predating Aristotle, did.[3] Moreover, Aristotle and his successors had philosophy, logic, and observation in their defense and canon law as their surest weapon. Furthermore, the Copernican theory about the solar system was not perfect—merely a closer approximation. Instead of 80 little mechanical orbits to explain heavenly motion, he had 40! But at least the sun was at the center of the solar system.[4] Moreover, this approximation of the underlying physical phenomenon made it possible for more accurate approximations to emerge.

Today those orbiting bodies are "seen" via remote imaging satellites. The extensive processing capabilities of mainframe computers allow details to be analyzed that escape the attention of trained visual observers and highly sophisticated mechanical reviews of photographic plates.[5] In 1990, Voyager II took a family portrait of all the shining worlds as it exited the solar system. This irrefutable visual proof appears remarkably simple if one overlooks the painful reexamination involved in astronomical discovery over more than two thousand years.

The law was not oblivious to this history. For centuries the Aristotelian philosophy controlled. Those who held differing views were banished, if not persecuted. However, the same urge for philosophical certainty and absolute finality is still present today. There are those who would wait until there is incontrovertible proof of damage to the ozone layer, of cancer resulting from exposure to cigarette smoke, or of a toxic hazard at a worksite. This urge for certainty is disabling particularly when vital interests are at risk. Equally crippling is the inability to deal with uncertainty. Lawyers are often criticized for their questioning attitude. However, the legal process is more demanding than either philosophical theory or civil tolerance because facts are the only foundation for legal judgment. This is a profound disappointment to those who expect certainty in human knowledge and others who are absolutely certain regarding their personal judgments. Moreover, the urge for certainty and the inability to tolerate uncertainty generates controversies. But these limitations overlook the importance of an empowering vision as the means of coping with blind certainty and incapacitating uncertainty.

Renaissance Living: Threshold for Exploration

It is time to claim a new renaissance by expanding exploration at every level. Change is not only inevitable; it is imperative.

We start from inspiration with a heroine who is a discoverer. The feminine form is purposeful, because we have thought of discovers as men for far too long.[6] As a result, we have forgotten, overlooked, or intentionally ignored those women who have made outstanding contributions to our progress as a technological society.

This new heroine is equipped with a special capability today. Information technology offers a dynamic merger of information and technology. In the hands of the ingenious and creative heroine, new dreams are possible and new explorations are empowered. But the use of information necessarily involves respect for the legal rights of others, no matter what technologies are used to collect, store, or communicate the information.

In the past year, the ABA's Section of Science and Technology has focussed on one form of information technology—electronic data interchange or EDI.[7] This technology is the natural outgrowth of high-speed, high-volume computing capabilities in conjunction with extensive databases. The current issues include technological twists, information complexities, and communication changes.

Technology Twists. Not all of the questions are new, even if the application is novel. Consider the following examples:

When is a bid "received" if the final page bearing the required signature for the multipage document arrives by fax after the deadline?[8]

When does a bank account have insufficient funds—when the check is presented for electronic payment or when the account is reconciled at the end of the day?[9]

Information Complexities. Other issues are intrinsic in information collection and utilization, such as:

Is a release necessary to consult bank records for credit purposes when the bank already provides banking services to a prospective borrower?

What protections are necessary to preserve the privacy of certain transactions?

A simple example illustrates some of these problems. A supermarket maintains a database on all purchases by its customers. It collects this information when the merchandise is scanned at the checkout register. The database identifies all purchases by the customer's check clearance number. A market research firm would like to profile the purchasers of two competing products sold at the store. Can the supermarket agree to license its database to the research firm and include information from the check-clearance records? The Computer Matching Act restricts government matches of this type,[10] but the statute does not affect private transactions or databases.

Information technology raises legal questions far beyond the technology.

Communication Changes. Information technology raises legal issues far beyond the technology. The common law refused to recognize ignorance of the law as a defense.

Should ignorance of the facts be eliminated as a defense when the factual information is readily available on a database?

What obligations might be imposed on corporate officers to search corporate databases regarding similar complaints about defective products, unsafe services, or improper transactions in corporate securities?

Should there be an additional requirement to continuously monitor data rather than simply retrieve it at a specific point in time?

Stained-Glass Windows and Horizons of Visualization

Alphanumeric systems have powered our current information technologies. As a result, the computational capabilities of microcomputers rival mainframes of a little more than two decades ago. In addition, intricate visualizations of data are possible with expanded memory capacities, sophisticated software, and enhanced speed. One could easily mistake a color video screen with a stained-glass window. The similarity does not end with the vibrant appearance of these visual presentations. In the Middle Ages, stained-glass windows portrayed important events for widespread communication to the public. These visual images compensated for illiteracy in the Middle Ages. These windows also provided a common base for community knowledge.

Modern Visual Communication. The video screen restores visual communication to its earlier prominence, including the capacity to visually reinforce verbal communication. However, visualization can also confuse textual content through imprecision, ambiguity or subjectivity.[11] The gradual displacement of verbal communication with an interactive visual form poses significant challenges for educational and legal institutions.

Testimony is still preferred in the legal process, though photographic and other visual evidence are widely accepted as evidence.[12] However, recent innovations in applications software enable visual representations to be reduced to individual pixels and then manipulated as digital data.[13] Extremely subtle changes can be examined in greater detail. However, substantial changes can be made without any appearance of alteration.[14] Docu-dramas can now seamlessly integrate fictional and historical material with the appearance of authenticity for the entire presentation.

The impact of this technology extends far beyond the obvious capabilities to manipulate visual data as digital data sets.[15] Visual communication has become a prominent part of our everyday routine, fulfilling the century-old adage that a picture is worth a thousand words. Soon it may be unnecessary to extract data from a legal document or code key phrases for later database analysis. Instead, the entire document will soon be available for viewing on the screen, leaving the viewer to draw her own conclusions regarding its contents and legal implications.

Visual analysis also enhances modern communication and provides new tools for creative problem-solving. More extensive and precise policy analysis is now possible with software programs.[16] Starting with engineering analyses, mechanical drafting and project planning, these tools now enable complex space missions to be integrated and diverse corporate operations to be coordinated.[17] But the unique capacity of this software is its ability to test scenarios and options against future circumstances, whether real or hypothetical. Visualization allows us to look ahead as well as recreate past occurrences.

Verbal Analogs. The present, language-based systems rely on skills that are not necessarily compatible with visual systems. Accordingly, difficult questions arise regarding the communication, reception and interpretation of visual information when the communication has legal significance. These problems are accentuated in the legal process when the parties must resort to formal systems of proof and interpretation.

The analytical process and the integrity of the data are just as critical as they were in the pre-computer era. However, the issues must be framed around the visual medium and its potential for manipulation.

When does a visual recreation of events become deceptive because its underlying premises are undisclosed?

Is there a visual equivalent of perjury?[18]

How are the imperatives of veracity maintained in presentations integrating historical and recreated segments?

Can we ever say that a "false-color" image bears a reasonable relation to the actual object or individual?

Validity and Reliability. Common law approaches to scientific evidence reveal the likely approach to these issues. When radar was first introduced as method for determining the speed of a vehicle, courts were skeptical as was the public. Elaborate proof of the underlying scientific principles was required to demonstrate the validity of the radar measurements. As time passed, the courts focussed on the reliability of a particular radar mechanism. Later the questions turned on the calibration of the specific equipment.[19]

Changing Emphasis in Law. During this century we have concentrated on the *interrelation of law and science* from the evidentiary problems underlying the use of radar and x-rays to the introduction of statistical evidence and computer simulations. In law, scientific legitimacy weighs the objectivity of scientific insight against the risk of junk science or fraudulent scientific claims. This has been a cooperative endeavor matching objectivity in science with objectivity in law while preserving the decisionmaking authority of the governmental branches and their underlying constitutional responsibilities.

The next century will focus on the *interaction between law and technology* as technological innovation and communica-

tion become the mainstay of societal development.

Law and Technology. Congress has implemented Article I, Section 8, clause 8 of the United States Constitution[20] to protect inventors, authors, and artists through the patent, trademark and copyright laws enacted over 200 years.[21] These protections are not complete nor do they address every emerging technology. However, the systems are in place. They have promoted the progress of science and useful arts, providing limited, exclusive rights in writings and inventions.

We must build an advanced national telecommunications network using high speed interactive databases—an interstate superhighway for information.

Most experts agree that America's competitive edge in computing technologies remains dominant in one area—software. U.S. laws have protected these works notwithstanding arguments that the investments of talent, money, and resources deserve little or very limited legal protection. Fortunately, reality has prevailed, primarily because the principal market for these products remains the United States. As a result, market forces and statutory protection have combined to maintain competitiveness.

America must do more than offer statutory protection and afford judicial remedies. We must promote technology on a broader scale than we have in the past. The government, empowered by law, must become a catalyst in the private sector, providing for the transfer of technologies to commercial markets and filling missing links in critical technologies when necessary.[22]

First, we must build an advanced national telecommunications network using high-speed interactive databases—an interstate superhighway for information.[23] It must provide ready access to information that is essential to a growing market and marketplace. The National Research and Education Network is one example. However, these networks must not be reserved for technical experts, the financial elite, or the well-educated. Availability must be widespread; access must be easy.

Second, we must make technology a partner in education and training.[24] From a corporate training perspective, the need for specific job-based training and broad-based education is clear. However, the distinction between education and training often depends on the provider rather than the content or context for learning. We must reorient our approach to emphasize the continuous learning process from infancy throughout adulthood. Education must become a lifelong process and training a regular component of adult development.[25] Furthermore, training and retraining must not be stressful events resulting from major relocations or dislocations. Instead, they must be natural occurrences in the continuous process of daily transitions at work.

Though initial professional degrees define early career opportunities, multicareer lifetimes are now common in the workplace. In this setting, everyone must "learn to learn" to overcome the half-life of formal education. As a corporate manager, it is just as important that an employee be equipped to learn as it is that an employee be equipped with knowledge. Certainly minimum knowledge is important. However, the job is likely to change dramatically in 5–8 years, perhaps by as much as 100%. *We must be prepared for a journey that extends over a lifetime.*

Student excitement about today's technological advances must be transformed into an understanding that those advances are an important feature of their future growth and survival. *We must be prepared to go the distance today and tomorrow.*

Conclusion

It is easy to articulate these needs, though for four years some have simply sought "reform." The greatest challenge is not that Japan plans to build a national digital broadband network by 1995. Instead, the greatest challenge is to provide equal educational opportunities through technology. Any blueprint for change must address what Jonathan Kozol calls the "savage inequalities" in American education.[26] Neither technological development nor economic progress will be secure unless every child has an opportunity to fully develop their abilities in our classrooms.

Every child is disabled when any child suffers the terrible conditions described by Jonathan Kozol. Educational reform that ignores or sidesteps these realities only compounds our problems. It is one thing to lose this opportunity because of a disaster such as tragic loss of the Teacher-Astronaut and the rest of the Challenger crew. But it is an even greater tragedy to lose countless children because their dreams are cutoff long before they even enter school by ceaseless poverty, incomprehensible violence, and constant indifference.

Our law and technology must continue to make learning possible throughout our lives, not just during the "school years."

My late father was a public school teacher and administrator for over three decades. He often asked, "What can we do to make citizenship meaningful for the children for whom dreams are a costly commodity and reality is fraught with physical danger and severe limitations?" Marian Wright Edelman expressed his answer in a single sentence: "America can not afford to waste a single child."[27]

Our law and technology must continue to make learning possible throughout our lives, not just during the "school years." In addition, we must not forget the people who make education possible. These women and men demonstrate the possibilities for a better life in their classrooms. They know firsthand that "where there is no vision the people perish."[28] But, they also understand that the future holds genuine promise as long as:

today's limitations can be overcome
by dreams of tomorrow, and
freedom empowers human exploration
to reach beyond today's horizons.

Bertram Robert Cottine is the Delegate for the Section of Science and Technology to the American Bar Association's House

of Delegates and is a former Chair of that Section. This paper represents the views of the author exclusively. The paper does not represent the views of the American Bar Association, the Section of Science and Technology, or the author's employer.

NOTES

1. Address at Rice University, September 1962, quoted in Nicholas Booth, Space: The Next 200 Years 21 (1990).

2. Today's software for personal computers enables tasks completely unattainable in the past, including:

- multiple scenario spreadsheets for corporate planning, *e.g.*, Lotus Dev. Corp., Lotus 1-2-3 for Windows (1991);
- astrometrical computations at mainframe speeds of 20 years ago, Tim S. Carroll, The Floppy Almanac User's Guide (2d ed. 1988); Jan Meeus, Astronomical Algorithms (1992); Pierre Bretagnon & Jean-Louis Simon, Planetary Programs & Tables (1986); Bao-Lin Liu & Alan D. Fiala, A Canon of Lunar Eclipses (1992); J.L.E. Dreyer, NGC 2000.0 (rev. ed. 1988) (*New General Catalog* of nonstellar celestial objects); pico-SCIENCE, SUPERSTAR (1986–1992). See generally John Mosley & Andrew Fraknoi, *Computer Software in Astronomy*, 20 Mercury 87 (1991) (review of astronomy software).
- desktop publishing with text editing, typesetting and composition, *e.g.*, WordPerfect Corp., WordPerfect 5.1 (1989) Microsoft Corp., Word for Windows (1991–1992).

Even mainframe capabilities have been vastly expanded to include activities such as detailed analysis of millions of commercial transactions.

3. William Sheehan, Worlds in the Sky: Planetary Discovery from the Earliest Times Through Voyager and Magellan 2-3 (1992).

4. *Id.* at 4-6.

5. Visual manipulation preceded computer image processing. However, the variety of techniques available with digital processing has expanded the possibilities for manipulation exponentially. Each "pixel" or data element can be analyzed and processed as one element in a digital array. Richard Berry, Introduction to Astronomical Image Processing (1990). This allows both statistical analysis and scaling using statistical models based on earlier photographic techniques. *Id.* Other techniques such as computer collages are based entirely on digital processing techniques. William J. Mitchell, The Reconfigured Eye 162-89 (1992).

6. It is also because I am watching a young daughter mature into a person of wisdom and stature.

7. Earlier this year, the Section of Science and Technology obtained passage of an ABA policy recommendation urging comparable legal status for written and electronic information. The Recommendation provides:

BE IT RESOLVED THAT the American Bar Association supports actions by federal and state governments, international organizations, and private entities designed to:

a. facilitate and promote the orderly development of legal standards to support and encourage the use of information in electronic form, including appropriate legal and professional education;

b. encourage the use of appropriate and properly implemented security techniques, procedures and practices to assure autheticity and integrity of information in electronic form; and

c. recognize that information in electronic form, where appropriate, may be considered to satisfy legal requirements regarding a writing or signature to the same extent as information on paper or in conventional forms, when appropriate security techniques, practices, and procedures have been adopted.

Recommendation & Report No. 115 in American Bar Ass'n, Summary of Action of House of Delegates 32 (1992).

8. 71 Comp.Gen.Op. 109 (1991).

9. EDI & Information Technology Div., ABA Section of Science & Technology, Model Electronic Payments Agreement and Commentary (Domestic Credit Transfers) (1992).

10. 5 USC 552a(o)-(q) (special provisions of the Privacy Act, 5 USC 552a, governing computer matching of data files by the federal government). *See generally* Bertram Robert Cottine, Administrative Practice Manual 701:1901 (1992).

11. "Visual truth" must deal with more than image processing—it must deal with intention and artifice. William J. Mitchell, The Reconfigured Eye 22-57 (1992). In Dean Mitchell's view, the problem arises when "the connection of images to solid substance has become tenuous"—a post-photographic era. *Id.* at 57. Even in the context of the photojournalist, critical issues arise far beyond the capture of visual data:

"Does the photojournalist or the editor control decisions regarding selection and framing?

"Who controls the tonal and color qualities of an image?

"When does a succession of small and apparently innocent manipulations add up to significant deception?

"Who guarantees the evidential value of a new photograph?" *Id.* at 55. Finally, Dean Mitchell inquires about the personal and societal impact of the image. "[I]f that image deceives or defames, who bears ultimate moral and legal responsibility?" *Id.*

12. The term "photographs" includes "still photographs, X-ray films, video tapes, and motion pictures." Fed. R. Evid. 1001(2).

13. See generally Janet Fries, Intellectual Property in Digital Image Processing, Bull. L. Sci. & Tech., Dec. 1992, at 3-6.

14. See note 5, *supra.*

15. *See generally* Richard Mark Friedhoff & William Benzon, The Second Computer Revolution: Visualization (1989); Edward R. Tufte, Envisioning Information (1990).

16. Popular versions of professional software exist. *See*, e.g., Maxis, Inc., SimEarth (1991).

17. *E.g.*, Primavera Systems, Inc., Primavera Project Management/ (P3/) 5.1 (1992) (critical path method); Symantec Corp., Timeline 1.0 (1991).

18. See note 11, *supra.*

19. *See generally* BNA Civil Trial Manual 91:1301 (1985–93).

20. U.S. Const. art. I, § 8, cl. 8 ("promote the progress of science and useful arts").

21. *E.g.*, The Copyright Act of 1976, Pub. L. 94-553, 90 Stat. 2541. *See generally* Patent, Trademark and Copyright Laws (1991) (Jeffrey M. Samuels, ed.).

22. These priorities are discussed in the Clinton Administration's "Technology Initiative." The major goals are:

- long-term economic growth that creates jobs and protects the environment
- making government more efficient and more responsive
- world leadership in basic science, mathematics, and engineering

All the goals depend on an information infrastructure either directly in terms of "information superhighways," education, and training or indirectly in terms of job creation, technical innovation, coordinated management, government partnerships with the private sector, critical technologies, and the basic science foundation. *Technology for America's Economic Growth* reprinted in *Daily Report for Executives*, Feb. 23, 1993, p. M-1.

23. *Id.*

24. The use of information technology in education and training has a synergistic effect. "Computers create an unprecedented opportunity for learning complex ideas, creating an environment that can closely approximate real work environments or experimental apparatus." *Technology for America's Economic Growth* 15, reprinted in *Daily Report for Executives* at M-7. Other opportunities include:

- interconnected systems
- imbedded training programs
- individualized learning programs
- distance learning
- reduced paperwork burdens

Id.

25. *See generally* Malcolm Knowles, The Adult Learner: A Neglected Species (3d ed. 1984).

26. *See generally* Jonathan Kozol, Savage Inequalities (1991).

27. Marian Wright Edelman, The Measure of Our Success 93 (1992).

28. Proverbs 29:18.

Working Conference on Technology and Law-Related Education

October 23-25, 1992,
Apple Computer, Inc., Boston, Massachusetts

Friday, October 23, 1992

CONFERENCE REGISTRATION (3:00 p.m.–3:30 p.m., Apple Computer, Inc.)

OPENING SESSION (3:30 p.m.–5:00 p.m., Seminar Room)

WELCOME: Mabel McKinney-Browning, *Staff Director, ABA Special Committee on Youth Education for Citizenship*

ORIENTATION: Paula A. Nessel, *Project Coordinator, ABA Special Committee on Youth Education for Citizenship*

PRESENTATION: "LRE and Technology: An Overview"

SPEAKER: James Lengel, *Education Technology Consultant, Apple Computer, Inc.*

PRACTICUM: (LRE Learning Stations, Charles River, Faneuil Hall, and Harborview Rooms) An opportunity for hands-on work with a number of LRE tools mentioned in the overview. Coaches will assist.

RECESS (5:00 p.m.–6:00 p.m)

RECEPTION (6:00 p.m.–6:30 p.m., Swissotel, Boston, The Lafayette)

DINNER SESSION (6:30 p.m. - 8:30 p.m., Adrienne Salon)

INTRODUCTION OF SPEAKER: Mabel McKinney-Browning, *Staff Director, ABA Special Committee on Youth Education for Citizenship*

SPEAKER: The Honorable Bertram Robert Cottine, *Immediate Past Chair, ABA Section of Science and Technology*

ADDRESS: "Shining Worlds, Renaissance Exploration, and Stained-Glass Windows"
Exploration and visualization command our attention and involvement as do few other human activities. In our own lifetime, exploration has sent our machines outside our solar system and taken humans beyond the earth's atmosphere. Visualization allows us to see the world in its minutest detail through electron microscopes and probe far-reaching vistas of galaxies. The computer facilitates new opportunities in the law, but also creates new challenges for it. In this evolution, the law is not neutral. It creates opportunities for the rebirth of exploration in every generation—creating new thresholds at each turn. It also expands our visualization and limits its reach—horizons of opportunity, balanced with continuity and change. But above all else, the law secures opportunities for change and intercepts the prevailing urge for certainty. However, law secures nothing if education is not a central component in its operation.

Saturday October 24, 1992

BREAKFAST SESSION (7:30 a.m.–9:30 a.m, Apple Computer, Inc.)
Presentations from the law magnet schools participating in the conference:

1. Leonne Lizotte, Easthampton, Mass.
2. Diana Beasley and Stanley Clemons, Oxon Hill, Md.
3. Harry Garvin, Savannah, Ga.
4. Connie Hankins, Miami, Fla.
5. Mark Sausser, Indianapolis, Ind.
6. Don King, Louisville, Ky.
7. Henry Tepe, St. Louis, Mo.
8. Phyllis Darling, Las Vegas, Nev.
9. Manuel Parra, Los Angeles, Cal.
10. Rachelle DeStephens, Oakland, Cal.
11. Jim Dyal, Portland, Ore.
12. Roger Westman, Tacoma, Wash.

BREAK (9:30 a.m.–9:45 a.m.)

PLENARY SESSIONS (9:45 a.m.–12:00 a.m., Seminar Room)

PRESENTATION: "Distance Education: Using Technology to Make All America a School"

SPEAKER: Pamela S. Pease, *Vice President, Educational Program Development, Mind Extension University: The Education Network*
Over the past decade, the use of technology to provide access to educational programming has become a reality. This presentation will provide an overview of the technology employed for distance learning; how and when distance learning is used; who uses it and what the challenges are for implementation. The summary discussion will provide a snapshot of what is state-of-the-art today and factors which will impact distance learning in the future.

PRESENTATION: "The Interactive Supreme Court"

SPEAKER: James Lengel, Education Technology Consultant, Apple Computer, Inc.
ABC News Interactive has produced a new interactive video program, "Powers of the Supreme Court," one of

The American Bar Association Special Committee on Youth Education for Citizenship acknowledges the generous support of the U.S. Department of Education, Apple Computer, Inc., and the American Bar Association Fund for Justice and Education in conducting this conference.

a three-volume set, entitled "Understanding Our World: Powers of the U.S. Government," hosted by Ted Koppel. In this program, Chief Justice William Rehnquist leads a discussion of the Constitution and its meaning and purpose. This presentation will demonstrate how the program can be used in an LRE classroom.

BREAK (12:00 p.m.–12:15 p.m.)

LUNCH SESSION (12:15 p.m.–1:30 p.m.)

BREAK (1:30 p.m. - 1:45 p.m.)

PLENARY SESSION (1:45 p.m.–3:00 p.m., Seminar Room)

PRESENTATIONS: "Access to LRI" (LRI = Law-Related Information). Five different methods of accessing LRE information will be briefly presented: 1) Washington State's LRE Directory on disk, 2) LREnet, 3) ERIC, 4) NICELnet, and 5) WESTLAW.

SPEAKERS:
Julia Ann Gold, *University of Puget Sound Institute for Citizen Education in the Law (UPSICEL)*
Julia Hardin, *Center for Research and Development in Law-Related Education (CRADLE)*
Jane Henson, *ERIC Clearinghouse for Social Studies/Social Science Education*
Wanda Routier, *National Institute for Citizen Education in the Law (NICEL)*
Beth Wilson, *West Services, Inc. (WESTLAW)*

PRACTICUM (3:00 p.m.–4:00 p.m.)

SMALL GROUPS (4:00 p.m.–4:45 p.m.)

RECEPTION (4:45 p.m.–5:15 p.m., Seminar Room)

Sunday, October 25, 1992

BREAKFAST SESSION (7:30 a.m.–9:00 a.m., Apple Computer, Inc.)
Presentations from the remaining law participating magnet schools, all from New York:
1. Beverly Vaughan, Rochester
2. Aaron Banks, Yonkers
3. Rozella Kirchgaessner, Brooklyn
4. Martin Leder, Bronx
5. David Lesser, Bronx
6. Debra Lesser, New York
7. Thomas O'Donnell, Northport

PLENARY SESSIONS (9:00 a.m.–10:45 a.m., Seminar Room)

PRESENTATION: "Integrating Social Studies with Technology"

SPEAKERS: Dick Rattan, *Social Studies Department Chair, Watkins Mill High School, Gaithersburg, Maryland,* and Linda Spoales, *Teacher/Specialist, Department of Academic Programs, Montgomery County Public Schools, Rockville, Maryland*
Veteran social studies teachers will share their success in using a personal computer to prepare and present their own teaching and learning materials using HyperCard techniques. They will illustrate the use of both commercially developed programs and those developed by teachers, and will demonstrate how lessons can be tailored to meet the needs of a specific class or course.

PRESENTATION: "The Software Survey Results"

SPEAKER: Phyllis Maxey Fernlund, *Professor, Chair of Secondary Education, California State University–San Bernardino*
A review of the survey results from the perspective of the chair of the National Council for the Social Studies Committee on Instructional Technology and avid technology enthusiast.

CLOSING SESSION (10:45 a.m.–11:15 a.m., Seminar Room)